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The "How" of—

Better Budgeting

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N.A.A. BULLETIN

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The Many Facets of Sound Inventory Control

by LELAND G. SPENCER

AT THE OUTSET of any discussion on inventory control, we must always have in mind the broad objective of our businesses—the achievement of optimum return on investment. This requires both the highest possible net income and lowest possible investment, and inventory is often one of the largest elements of investment. However, it can be a very low figure with a healthy liquidity makeup, a fast turnover and favorable payment terms with vendors. A negative investment in at least a portion of inventory may result when accounts payable for material are greater than inventory value.

Inventory Responsibilities — Direct and Indirect

In our organization, inventory size determination and control start with our marketing function. This function has the responsibility of determining what products will be sold and when. In turn, marketing must, in conjunction with manufacturing, determine the best time to manufacture, keeping in mind the lead time required for both manufacturing and getting the product to the customer. Essentially, marketing is responsible for inventory size and timing. This applies primarily to finished products. The manufacturing function must be given the responsibility for planning all production phases, including that of purchasing. Some of the responsibilities that manufacturing has are:

For machines and plant—This means providing the proper equipment and space to permit lowest possible conversion costs and to effect efficient handling and storage. Each of these considerations has a definite effect upon inventory size and control of dollar value. However, although low costs and output must be uppermost, they must not be achieved at the expense of investment return.

For men—An organization of direct and indirect people must be planned which will ensure product quality and service and, at the same

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time, achieve lowest possible costs. Again, the action here will have a definite effect upon inventory values. One very important phase of personnel planning is that of stability of employment. Without some degree of this, we cannot have a healthy business.

For materials—The very important responsibility of purchasing the right materials, in the right quantities, at the right time, and at favorable prices form the substance of this responsibility.

But marketing and manufacturing are not the only functions involved in inventory control. Perhaps the function which plays the most important role indirectly is that of finance and, specifically, its sub-function—cost accounting, in all their specialties. One of the prime responsibilities of a cost specialist in our plants is that of assisting in inventory control. This is a two-fold responsibility in that he must be concerned with the size of the current inventory as well as with the protection of the company's assets. Specific work which we expect our cost specialists to carry out in this area includes:

1. Approval of each major purchase order in each product area. With his knowledge of production requirements and of the inventory situation, as well as that of material sources and price levels, the cost specialist is expected to pass on the wisdom of each purchase. They cannot be made without his signature.
2. Verification of shipping container counts on a regular basis, in order to check on the accuracy of billing to customers and the credit to the inventory account.
3. A regular program of checking incentive wage payments.
4. Occasional audits of spoilage reporting routines. A weakness in this area contributes directly to an inventory deficit (the cost man's nightmare) and to an overstatement of inventory value. Frequent checks must be made of factory reporting procedures in order to make sure of proper reporting of losses and inventory control.
5. Reconciliations of production with shipments, scrap and inventory. These are carried out at least quarterly—more often, if possible, on large production items. This type of check isolates discrepancies and spotlights weaknesses in recording and reporting procedures and in control.
6. Overall analysis of reported month-end inventories, a definite "must" for each cost analyst. This is effected by securing a detailed listing of raw materials and finished goods on hand and surveying and estimating the value of work-in-process on the manufacturing floor. If the total of the two do not add to the book figure, then there is real work to be done to find out what, if anything, is out of control.
7. Review of shipping notices covering miscellaneous materials leav-

ing the plant for any one of many reasons. The cost specialist must review these regularly for purposes of determining whether or not there is potential billing of inventory or expense items involved.

Most of these responsibilities are more in the area of protection of the assets than of inventory size but they do play a very big part in our inventory control practices. In addition to cost accounting, other sub-functions within the finance function have definite indirect responsibilities in the inventory control area. Some of these are:

1. Our personnel accounting staff must be alert to overpayments to incentive workers and must obtain answers to questions before payments are actually made. Most over-payments represent a recording of quantities in excess of those actually produced by specific operations. If not detected and corrected, we have an overstatement of inventory value.
2. Again, in personnel accounting, our people are expected to review operator earnings with the wage rate function in order to have a check on piece rates being paid. This must be done before these rates become "standard." After that, by union agreements, they cannot be changed.
3. The general accounting staff must be alert to unwise purchases, excess payments to vendors, shipments of miscellaneous materials which should be billed rather than shipped gratis, payments for materials not received, etc.
4. Our procedures people not only review all plant routines regularly, but also are a very definite part of the team writing manufacturing, engineering, purchasing, financial and other procedures. They are expected to have inventory size and control uppermost in their minds when constructing these procedures.

Another plant function which has a very definite responsibility in the control of inventory is that of quality control. In many of our plants this function is entirely independent, answering to the plant manager. Its contribution to inventory control includes:

1. Alertness to incorrect materials received so that they are refused when delivered. In this manner they never get into the financial routines and, therefore, never become a part of recorded inventories.
2. Early reviews of materials received which are not up to specifications, with the responsibility of getting them back to the vendor in the same month received. If accomplished, inventory size is not affected.
3. Intelligent and efficient follow-up of items in process which have been rejected as possible scrap or salvage. The holding of these items to a minimum aids in minimizing inventory size.

4. Early processing of customer returns for possible salvaging in whole or in part. We attempt to have no open returns at the end of the month.

Control Procedures; Tabulating Routines; Forecasting Techniques

Responsibility for writing specific procedures in all of our operating areas rests with the procedures analyst in the financial area. Our procedures are termed standard practice instructions, with separate symbols being assigned to specific functional areas such as marketing, manufacturing, financial, administrative, etc. Although the procedures analyst prepares each instruction, he must work with the personnel in the area in which it is to apply. As an example, the purchasing section would certainly play the leading role in developing an instruction which covered the formula for determining quantities to be purchased, for securing bids on materials to be sold, the pinpointing of alternate sources, etc.

The procedures analyst reconciles divergent interests. The manufacturing engineering section would certainly want a procedure that would result in the most efficient handling of materials, but the procedures analyst would want to make sure that any effect upon other plant functions would not result in inefficiencies which could be avoided. The procedures analyst's approach is one which assures uniformity of procedure and should guarantee the most efficient operation in each functional area. It is aimed toward coordinating the overall operation through the direct cooperation of each employee.

It is impossible in the space available to relate each procedural area to inventories. However, it should be emphasized that tabulating equipment plays a big part in our control of inventories. The size and type of equipment naturally varies by size and complexity of operation. Each customer's order, after pricing and acknowledgment, is fed into the procedure of establishing material, labor and equipment requirements. This information is tabulated each week so that we have the following information directly at hand:

1. Material requirements
   - Type
   - Specification
   - Quantity
2. Machine loadings
   - By equipment type and size
   - Machine hours
   - Manhours to operate
3. Direct productive employee requirements

With this information available at least weekly, together with a knowledge of raw material inventories, total and "mortgaged", our purchasing people are

in a position to order the right quantities to take advantage of quantity discounts without too much of the element of gamble, and to perform an efficient job of scheduling materials in. Further, our manufacturing people are in an excellent position to do a more professional job of planning equipment utilization as well as a better job of advance planning of manpower. When low levels of activity appear ahead for certain equipment and process areas, manufacturing staff can go to marketing and ask for permission to fill some of the gap by advance production of products or components.

Frequently, the tabulating information is revised more often than weekly and often it is reviewed, audited, and corrected, where necessary, through a current inventory of net open orders. Obviously, the master file is adjusted for customer product returns, actual spoilage, customer order and schedule changes, etc. Through this mechanized procedure, we have materially improved our customer service, increased the efficiency of the plan, reduced overruns of materials and end products, and substantially reduced our losses from obsolescence. In other words, the inventory has been more efficiently and effectively controlled. In recent years, our marketing function has done a professional quality job in the sales forecasting area. No individual or group will ever be able to guess the future correctly all of the time, but techniques can be constantly improved. At company level, there is a group of men who keep their eye on specific business barometers. Their findings and forecasts are fed regularly to the various operating units, particularly at the time of preparation of the annual budget. In addition, we have individuals in the marketing function of each department who are called administrators. They are pretty much financial advisors to the manager of marketing, and one of their specific functions is to collect basic data from the field for purposes of forecasting. Information from each of these areas has been of real value to our manufacturing people in the planning of production and in the control of inventory.

Control through Standardization

Standardization is an area which has received tremendous attention in recent years. Many large manufacturing units of the company have a standards function in which personnel are engaged in not only establishing engineering and manufacturing standards but also devoting substantial manpower to bringing about changes in materials in such a way that many special requirements may be standardized into one. Our unit is not large enough for this, but we are in a keen, competitive business and, for this reason, it is imperative that we try every

means possible to standardize materials and processes. Let me recite some of the progress made in this area during these past few years.

Many molded plastics parts, particularly those used in industry, have metal inserts molded in place for purposes of anchoring electrical contacts or other similar purposes. A great number of these inserts are very similar and have only one functional area, the drilled or tapped holes. For years we have produced the exact insert designed by the customer without giving too much thought of whether he could just as well use one that we already stocked or used in other molded parts. We put an idea team to work on standardizing inserts as far as possible and surveyed every part which had been active during the prior year. We designed a series of standard inserts and went to customers to get permission to use these in place of those required. In very few cases were we turned down, and, in most cases, the customer was happy to conform. As a result of this standardization drive, we reduced the need for various custom-designed inserts by an unbelievable ratio. In turn, the annual cost of these items, as well as the storage area required, was reduced substantially. Beyond this, there were countless savings in clerical expense, material handling, and one of our most costly items—small quantities of special inserts left over at the end of production runs. There was, thus, substantial improvement in cost and inventory control and, in addition, our competitive position was improved.

Another specific improvement in control came from our program of standardization of pre-form or pill dies. In one of our largest areas of plastics production, we use millions of pills or pre-forms composed of compressed molding powder. Over the years, we have designed die shapes and pre-form weights which would give us the best quality at lowest cost. As a result, we had an inventory of literally hundreds of pill dies. Think of what this meant in the inventory area when any number of compounds were used on many combinations of dies. Think of the pre-forms machine and man-hours lost in setting up for each of the specific combinations. Our technical service man specializing in compounds came up with the idea of standardizing on a few pill die shapes, even at the expense of using a little more material on some molded parts. We studied the activity of thousands of different molded parts and came up with a limited number of standard pill dies. As a result of standardizing, we reduced setup time, cut our pelletting operation substantially, removed inefficient equipment from the center, materially reduced pill die and equipment maintenance, and effected a substantial cost savings in spite of the fact that we added material cost to many of our products. More important, through this form of standardization and that of numbers of basic compounds, we reduced our inventory of molding compounds substantially.

One other area of standardization really paid off in inventory control and, perhaps more important, cost reduction. This was in the packing material area. The bulk of our packing materials are in the form of corrugated boxes. Over the years, we have felt that we have done an efficient job of specifying the right carton for each molded part. However, the cost of these items annually runs into substantial figures. In analyzing these expenditures, we found a familiar situation, i.e., a small percentage of items represented most of the dollar cost. What could we do in this circumstance? We went to the foremen, production men, and packing specialist. Almost to a man, these people felt that not much could be done because the parts had to be packed just so. We suggested that a standard box be used for certain items and the cry went up, "You are wasting space." This ignored a more important angle. As an example, Part A was packed in a container that had a base cost of only 18 cents but, because of small lot charges, was costing 48 cents. We changed this item to a different box costing 22 cents, added a little newspaper and made a net saving of at least half. Many, many other instances showed very high cost savings. As a result of this standardization program, we have reduced the number of different cartons stocked and reduced the overall annual cost substantially. Space required has been materially reduced; substantial clerical expense savings have been made; and carton obsolescence has been almost entirely eliminated. Even if packing material is treated as a current expense and not inventory, such improved control will pay off.

Role of Reports in Inventory Control

What about the reporting of inventories? We have many types of reports which are "musts" and which aid materially in the control of our inventories. This, of course, is in addition to the current records which are maintained on each item. Perhaps the more important reports are:

1. A summary report by product line which goes to the superintendent of each line, the plant manager, the department general manager, the manager of marketing, and certain other selected supervisory personnel. This report details input and output by major components in total dollars only. It reflects the change in inventory in each area for the month and year-to-date and gives a detailed breakdown of the ending inventory into raw material, work-in-progress, and finished goods.
2. A report of finished products which is somewhat detailed but only to the extent that it has real value to marketing and top management. The total value of finished products is broken down be-

tween (a) those specifically authorized by the marketing section, (b) those manufactured to stock (a gamble by manufacturing section) and (c) ahead of schedule (also somewhat of a gamble).

3. A complete detailed report of raw materials on hand.

Each of these reports is made monthly although, in the case of raw materials, more frequent reports may be required. Each has a very specific purpose. For the most part, we might say that they are for audit, policing, or efficiency perspective purposes. Certainly they are valuable for these uses. However, they are also used for forward planning, for inventory control guidance, and for keeping "on top of" possible excessive and/or obsolete inventories.

There are many other detailed reports prepared, too numerous to mention here but which play some part in the area of control. Some of the more important ones are (1) purchases, usage, inventory and requirements of specific items, (2) purchases from specific vendors, (3) inventories of major expense items not treated as inventory items for statement purposes, etc.

Measuring Performance

How do we achieve measurement of performance in the inventory area? Bear in mind that we must always remember the basic objective of our business—that of earning optimum return on investment. In order to achieve this, we operate for control of inventories by identifying a basic fixed amount, the increase of which is to vary with production rate. Each type of inventory is analyzed for purposes of determining (1) a reasonable fixed content which will assure availability at competitive price and (2) allowable variable inventories based on the direct material and conversion cost content of the production ahead. Measurement is strictly on the basis of performance against these budgets.

Here it might be well to bring out a change in measurement which is relatively new to our company. Over the years, we had always related current ending inventories to output during the month in order to get a turnover ratio. A few years ago, one of our top financial men reasoned that measurement on this basis was not at all realistic. He questioned why we related current inventories to past production and sales. Further, he reasoned that current inventories were accumulated for the future and not the past. It was not very easy to argue against this point of view. So our practice was changed. Our financial statements now reflect dollars of inventory and number of weeks' requirements based on estimated production ahead of us for roughly the normal turnover period. Just so that we do not make it easy for our people to show up well when they

are not performing well, our statements show number of weeks on hand on three bases:

1. Estimated this month
2. Estimated three months ago
3. Actual three months ago

In addition, this statement shows budget for the year as well as variable budget allowance for actual production and estimated production ahead. Enough numbers are thus provided to make it difficult for any supervisor to cheat. But the real objective of the figures is to reflect the degree of performance.

Many of our top management people still look on turnover as the most sound measurement. They might agree that some allowance has to be made for volume changes, but they still have a definite turnover ratio in mind which is real tough to attain. As I have mentioned before, our business demands a fast turnover of inventory and usually we get it.

Checking Up Through Audit

What do we do along the line of inventory audits? As you might well suspect in a company as large as ours, there are many types of audits which are not only necessary but specifically demanded by overall company instruction. A few types of audits which are carried out regularly are:

1. There is the annual audit made by our traveling auditors. In these audits, they get into ordering procedure, shipping routines, physical inventory taking and valuation practices, etc.
2. There is the occasional audit made by the public accounting firm retained by the company.
3. Another type of audit has already been described in setting forth the inventory responsibilities of the cost specialist.
4. The financial staff performs regular test-check audits of physical quantities of "large user" items on hand at the month-end against those recorded in the perpetual inventory record.
5. Very frequent audits of procedures are made by the procedures analyst and others in the finance section to make certain that the proper routines are followed.
6. One of the most important audits made by the financial section is that of payments to vendors. This involved the checking of unit prices paid for materials, of quantities paid for versus those received, of payment terms, cash discounts, etc.

Education in Inventory Control — A Real Need

The final area of cost control activity to be covered in this article, and one that is a "must", is that of education and advice. This is extremely important if we are to aid in the improvement of performance in this area. If we look at the improvement made in our company during the past 10 or 20 years, it is quite obvious that education and advice has played the biggest part in bringing this improvement about.

These are some of the things that we did (and still do):

1. All supervisory personnel were taken into our confidence and shown operating results at regular monthly management meetings. Performance against budget and forecast was shown and reasons for non-performance given.
2. The return-on-investment concept was explained by financial men with down-to-earth explanations of investment, income, etc.
3. Memorandums were prepared on the cost of carrying inventory. These not only spelled out direct and intangible costs but also illustrated the effects of good and poor turnover on the rate of return on investment.
4. One of the most beneficial projects was that of advising purchasing people on scheduling. Because we have such a fast turnover, one of our major objectives is to get as much material in as possible on the first day of the new fiscal month and as little as possible during the latter part of the month. By following this practice, we are minimizing month-end inventories.
5. Another educational project was one of acquainting manufacturing personnel with the effect of excess and obsolete inventories on income and taxes. This was a real eye-opener to most of our people and has resulted in a much lower inventory of these items as well as effective utilization of some that were on hand.
6. Finally, we have a current day-to-day project under which we in finance work closely with the purchasing section in determining the economics of certain proposed expenditures. We also have a similar project with manufacturing and advise on all proposed programs of manufacturing-to-stock. Here it is a question of return on the added investment, e.g., do the cost savings from longer runs result in a satisfactory return?

There is always the opportunity to improve upon inventory size, liquidity, and turnover. We have achieved much sounder control in this area through the practices outlined in this article. We believe that similar practices and procedures will prove to be of material benefit to others.

Leasing Equipment—What Are the Advantages?

by FRANK S. LYNDALL, JR.

LEASING as a means of acquiring the use of capital assets is receiving more and more attention in today's literature. The usual arguments presented for leasing as compared with other forms of financing might be summarized as follows:

1. Frees capital for more profitable employment.
2. Provides cost savings over certain other forms of borrowing.
3. Improves balance sheet ratios.
4. Avoids dilution of ownership.
5. Provides defenses against inflation and obsolescence.

Under close analysis a number of the above arguments do not hold water, but there are likewise many other factors less prominent in the literature which indicate definite advantages for leasing. This article concerns the lease of personal property capital assets, i.e., equipment, and excludes land and buildings.

Some Fallacies in Supposed Advantages

The first observation which should be made is that leasing is just another form of debt financing. It does not free capital for more profitable employment because the method of financing used does not influence the capital requirements of the company. Secondly, leasing adds a third party to what is normally a two-party transaction. Banks and insurance companies are not permitted to own personal property capital assets with the exception of transportation equipment. Therefore, companies cannot lease equipment from lending institutions but must employ a third party to hold title to the property. The money ultimately comes from the same source, probably at the same cost as in the straight two-party transaction. The third party, the lessor, must make a profit. Hence, the cost of leasing must necessarily be more than that of obtaining funds through term loans or debentures. The individual company may avoid the requirements of maintaining compensating balances with the lender; on the other hand, if the

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lessor is required to keep a certain amount of funds on deposit, this cost will almost certainly be passed on to the lessee.

The third of the usual arguments is that of improved balance sheet ratios. This is open to the same objection as the argument on releasing capital. The ratios, themselves, and the use which the financial community makes of them are a matter of disclosure and of how completely the analyst understands the complete picture of the company's financial operation. If he has all the facts, the analyst would make no distinction between a leased asset and one which was owned by a company and financed by loans or bonds. The leasing advantage depends on poor analysis and is more of a moral than a legal question. The Securities and Exchange Commission has established limits on rental obligations above which these obligations are considered to be material and, if so, must be disclosed in a company's statements. These limits are 5 percent of the company's assets related to the total obligation under the lease or 5 percent of the company's current expense related to current rental payments.

The avoidance of dilution of ownership may properly be an advantage for leasing but it is also true for other forms of debt financing. The statement that leasing provides defenses against inflation and obsolescence *may* likewise be true but, if a company believes it, it is betting that it knows more about the future market for the equipment than the manufacturer does.

Nevertheless, despite loopholes in usual arguments favoring leasing of equipment, the fact remains that leasing is one of the fastest growing businesses in the country today and that more and more intelligent businessmen are finding advantages in leasing. If the usual arguments do not hold water, what are the real reasons for leasing?

Bona Fide *Advantages*

The leasing companies will readily admit that leasing is a form of supplemental financing and that companies which have little or no debt have little reason to lease unless there are definite operating advantages in their particular situations. They argue that leasing enables companies to extend their debt limitations because of the contingent liability provided by the lessor and because the lessor and lender have positions with respect to the assets involved which are senior to those of other creditors.

A major factor in the growth of leasing has been defense contracts. Historically, companies doing business with the government have not been permitted to claim as an expense interest on the capital which they use in this business. They have, however, been allowed full claim for rental payments

made on leased facilities. This situation makes it uneconomical for companies to purchase new facilities for use on defense contracts. Since many of these facilities also involve special-purpose equipment for which there is no market beyond its current use, leasing permits a company to tie the term of the lease to the contract life and provides a basis for damages in the event of premature cancellation by the government. (It should be noted that sale and lease-back of owned facilities is not permitted.)

Tax considerations with respect to leasing are thought to be overemphasized. If the term of the lease contract is much shorter than the depreciable life of the equipment, then the contract is apt to be considered by the Internal Revenue Service as a conditional sale and the rental payments disallowed as a deductible expense. In sale and lease-back transactions, however, there can be real tax savings. This is true where the fair market value of the equipment is substantially in excess of the book value. Through sale, not only the book value but also the appreciation less capital gains tax is obtained. The rental payments are then a deduction from ordinary income. The advantage lies in the difference in tax treatment and should offset the additional costs involved.

Another tax advantage of leasing has to do with state income and franchise taxes. A number of these taxes are dependent on whether a company "does business" in the state. If a company's only activity in a state is selling, then leasing of office space, automobiles, and storage facilities may effectively prevent the state from assessing either income or franchise taxes. Again, the facts of the particular situation will determine whether leasing will result in actual savings.

A variety of advantages attributed to leasing concern the internal financial procedures of a company. Here leasing is used because it is the fastest, easiest thing to do. Managers of so-called "well-managed" companies will readily admit that they lease certain assets because the red tape involved in their appropriation request procedures results in considerable additional work on their part and delays in receiving the needed equipment. The difference in their authority with respect to capital expenditures and to rentals permits them to do this.

Some companies cover this loophole by requiring that all assets, whether for lease or purchase, follow the appropriation request procedure: but, having done this, they then use different yardsticks in viewing the proposals. Capital expenditures are justified on the basis of return on investment, while leased assets are considered on comparative costs. Generally, this difference in treatment makes it easier for the manager to get a lease transaction approved than to purchase the same asset. This is because the effective yardstick of the cost comparison is slightly above the cost of borrowed funds, while that used on the capital ex-

penditure is apt to be a combination of debt and equity and may include some safety factor.

Budget limitations are another reason why some companies lease. In the allocation of monies for capital expenditure, a manager may not get the amount he feels is needed. As manager he is responsible for the performance of his operation and he may use leasing to get the necessary equipment. He may be required to include the leased assets in the capital base upon which the return on his operation is based, but at least he successfully abridges the budget procedure by leasing.

Then, too, companies in a comparatively tight financial condition find that leasing can temporarily solve a major financing problem. The amount involved may be too small to warrant arranging a loan or floating a bond or stock issue. By leasing minor items the company is able to tie its major financing to its major projects and to avoid paying interest on stand-by credit.

Leasing contracts can be, and are being, written on either a unit of time or unit of use basis. The unit of use basis permits a company to relate its expense to the value received from the new asset and this may, in some cases, outweigh the additional costs involved. Unit of use contracts may also provide real savings for companies which have a seasonal need for movable equipment. Under rental the peak demands of more than one customer may be met at a cost which is less than that of ownership under any other type of financing.

One of the least talked about reasons for leasing concerns executive bonus plans. Many of these plans provide for a percentage of the profits to be paid in bonus after deduction of a specified return on the assets of the company has been earned for the stockholders. In leasing, there are no assets upon which to make such a deduction; thus, the full percentage of the increased profits is paid in bonus.

A Form of Financing with Significant Advantages

In summary, leasing is a form of supplemental financing, more expensive than term-loans or bonds but possessing a number of real advantages. It is used in defense contracts; it is a way out of many internal company problems; it has tax advantages in some situations; and there are other miscellaneous advantages. Leasing is not a cure-all, but must be measured in terms of each situation for which it is being considered.

Accounting for Pension Costs

by ROY M. MATTHEWS, JR.

OUT OF THE ECONOMIC UPHEAVAL of the 1930's and the fiery crucible of another world war, came an American public obsessed with a driving desire for financial security. This phenomenon resulted in two unique institutions: the Social Security Act and the private pension fund. So much is history. What few people realize, however, is that the former is totally overshadowed by the latter in its dollar valuation, effect on the national economy, and growth potential. The responsibility for evaluating, interpreting and reporting the effect of such private pension funds is a challenge to the accountant's imagination and technical ability.

This paper will deal with one phase of the accountant's responsibility to management in connection with private pension funds, the determination of accrued pension costs and their accounting treatment. The explanation of the procedures and techniques worked out for the development of pension cost and its recording under our retirement plan will, perhaps, serve as an illuminating example of the manner in which one company handles the problem.

It is a trusteed plan administered by a retirement committee, covering all company employees. Continuous employment prior to the normal retirement age (65) is considered service. All compensation, including overtime compensation, shift premium, holiday pay, vacation pay and sick pay, paid by the company during the period of service, is considered earnings. All contributions are made by the company. The retirement plan formula "integrates" with Social Security so that there is a variation among employees in benefits earned under the plan in addition to the Social Security benefit. Provisions are made for early retirement benefits and disability benefits under certain conditions. No specific method of funding is prescribed by the plan.

Problems in Determining and Financing Pension Plan Costs

There is a considerable difference between the cost of a pension plan in any year and the amount of financing which may be done in any year for such plan.

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Pension benefits may be financed in several ways. It would be possible to merely pay pensions to retired employees from company funds as payments became due (pay as you go). There are many disadvantages, however, to this apparently simple arrangement. Generally, a funded pension program is considered as the best policy. Given a funded program, there are several choices as to how the financing can be accomplished. At one extreme, a company might set aside the appropriate amount in the fund at the employee's retirement. At the other extreme, the company might contribute to the fund the best estimate of future pension requirements on the date the employee is hired. In between, there are various schemes of financing a pension program.

It is generally accepted that pension costs accrue over the working lifetime of an employee and such cost accrual is an amount which would be sufficient to pay for his retirement benefit at the time such employee terminates employment for retirement purposes. This cost amortization may be the same as the financing method used or it may be somewhat different. There are various methods of determining the cost accrual just as there are various methods of determining depreciation. However, each cost accrual is normally based on the principle that the cost accrues while the employee is producing for the company.

We believe that the best cost accrual method is what is known in the trade as the entry-age-normal-cost method. Under this method the objective is to accumulate the cost of the employee's pension benefits from date of employment to retirement date at the same percentage of his earnings each year. In order to determine this level percentage, various mathematical computations are required. It is necessary to estimate how long the individual will live and receive benefits after he retires, his probability of surviving with the company until he reaches retirement age, his future earnings in comparison with his present earnings, the portion of his pension which can be paid with accumulations on behalf of other employees who do not survive, and the interest rate which the invested pension funds will earn.

The percentage as described above, when applied to the payroll, yields the normal cost or cost accruing for the particular year. If the plan is in existence when the first employee is hired, the payment of such normal cost will provide sufficient funds to meet all pension obligations. Since many companies have been in existence for some time before adopting a pension plan, the accumulated normal costs which have not been paid appear as the initial past service requirement. If no funds are available at the time, the total is referred to as the "initial unfunded" or the unfunded cost of past service requirements. The initial past service requirement may be financed as desired. However, if it is desired to have a qualified plan under Internal Revenue Service regulations for

tax deduction purposes, it will be necessary that at least the interest on the initial unfunded past service requirement be paid, so that the unfunded amount at any time will not exceed the initial unfunded. This payment of a normal cost plus the interest on the unfunded cost, defined as "current cost financing," is generally considered as minimum actuarially sound financing.

The method that has been used for valuations of the cost of our plan is a modification of the entry-age-normal-cost method. The latter method is applied exactly for the first valuation or upon a change in the plan, at which time the initial unfunded cost is "frozen." Subsequently, the initial unfunded cost varies only by the amount that contributions fall above or below the current costs. In this way gains or losses resulting from deviation of actual experience from assumed experience (predicted by the actuarial assumptions) are not reflected in past service requirements. Rather, they are spread over future normal costs to be amortized over the average future service lifetime of active employees. This modified use of the entry-age-normal-cost method eliminates the necessity of adjusting prior years' costs for variations in the actual experience from that which was assumed.

Many companies have, in past years, made substantial contributions toward the principal of their initial unfunded costs. The present practice for some companies is to pay current costs (the normal cost plus interest on the remaining unfunded cost). However, many plans prescribe no specific method of funding. Concerning this problem, Mr. Russell R. Reagh, of Arthur Stedry Hansen, consulting actuaries, in an address before the 1958 Conference of Actuaries in Public Practice, stated: "In my opinion, with very few exceptions, complete funding (the maximum contingent reserve) could not be justified even as a long range objective. For the majority of pension plans, a completely funded reserve, under the 'entry-age-normal method,' would exceed by a substantial margin the amount required to provide the accrued benefits of every employee on a fully vested basis, that is, the 'termination liability'. It might be well to finance the plan through contributions in excess of the level current cost to build up a reserve. The amount of the reserve might well be equal to one year's contributions so that in a year of very low profits contributions might be suspended or reduced."

It is this writer's opinion that the adoption by the consulting actuarial profession of the terminology, "unfunded cost of past service requirements" or "initial unfunded cost" is unfortunate. Just as the accountants have had to live with the ambiguous term "surplus" so will the actuaries be forced to sleep with their "unfunded cost of past service requirements". There is some agitation among consulting actuaries and industrial accountants for the revision of

the term to help clarify the meaning and convince the public accounting profession that the financial statements need not be footnoted for this item. However, it is the present accepted practice for this figure to be included in the footnotes to certified financial statements even though, as a practical matter, it does not represent a true liability and has little meaning to the reader.

In newly established pension plans, the question frequently arises as to the need for accumulation of a large pension fund when benefit payments are rather low, often even lower than the investment income on the current assets of the pension trust. Basically, the reason for the fund is to guarantee the planned retirement income to the employee and, therefore, it must be able to provide for future as well as present needs. When financed under an actuarially sound basis, the fund ensures that the employee will receive his retirement benefits regardless of the future economic developments. Eventually, assuming the continuation of a policy of making contributions in level amounts varying only in relation to the number of employees covered, the fund should reach the point where the annual benefit payments will equal the annual income (company contribution plus pension trust income). At that point it can be assumed that the principal of the fund will never be used to pay benefits. If the pension contributions have been properly calculated each year, the principal would be used only to pay benefits upon failure or decline of the company or termination of the program.

Computation of Pension Plan Cost Based on Individual

Our company's retirement plan has been in existence since January 1, 1947. From then until July 31, 1958, the cost was estimated each month (based on the prior year's cost) and charged to general and administrative expense. At the end of each year, our consulting actuary made a valuation of the actuarial requirements to determine the amount to be contributed for the year. The total estimated cost which had been accrued monthly was then adjusted to reflect the actual amount to be contributed.

This method proved to be awkward and unsatisfactory. Monthly charges for pension costs on the estimated basis were often found, at year-end, to require substantial adjustment. It was also realized that, from an accounting standpoint, pension costs should be considered a part of direct labor burden rather than general and administrative expense. It was obvious that it would be advantageous to develop a method for computing the actual costs by cost accounting centers (departments) each month. This would eliminate the large adjustment required at each year-end and, even more important, it would make

it possible to charge the pension costs to individual work orders as a part of direct labor overhead.

Discussions were then held with our consulting actuaries. At the outset, so many problems were envisioned in developing the procedure for the company's monthly computation, by individual, that they appeared unsolvable. Some opponents were skeptical of the feasibility of determining pension costs by applying to each employee's earnings the actuarial assumptions which in the past had been applied to the total payroll. The biggest objection came from those who believed that we should continue to consider pension costs as general and administrative expense on the basis that they were only estimates. Then, too, they argued, management could elect to pass making contributions in a lean year, since contributions are theoretically not compulsory. For these reasons, they believed that the pension cost would not be a proper part of the direct labor burden. However, our consulting actuaries, after considerable study and discussion, developed factors which could be easily applied to each employee's earnings. Thus, individual accrued pension costs for the period could be determined and applied as direct labor burden.

The accounting classification of the pension cost was eventually decided to be a proper direct labor burden item. This decision was based on the realization that (1) pension costs are only one of a family of factory overhead costs which involve estimates and (2) pension costs are directly related to labor and should be charged to costs in the period in which the labor cost was incurred, regardless of whether or not the contribution is paid to the trust in that period. This gives full recognition to the theory that, as with any accrual, the annual contribution to the trust need not necessarily match the current year's pension cost. Although it is true that, under a company contributory plan, annual payments to the trust are not compulsory, the costs continue to accrue as long as the plan is in existence.

A procedure was established by which the costs could be computed monthly by our tabulating department and charged to each appropriate department as overhead on direct labor. This procedure calls for the application of three factors against each employee's monthly earnings annualized. At the company's fiscal year end the actuary makes a valuation of actuarial requirements to determine the pension cost for the year. Any difference between the cost determined from the annual valuation and the total cost as computed monthly by the company is reflected in the subsequent year by an adjustment factor used in the monthly computation. Such adjustments have been found negligible.

In computing the monthly costs, the actuarial factors are applied to each individual employee according to his entry age and completed years of service.

There are five factors used: (1) gross benefit and cost factor for salaried employees, (2) gross benefit and cost factor for hourly-rated employees, (3) cost reduction for social security factor for salaried employees, (4) cost reduction for social security factor for hourly-rated employees and (5) an adjustment factor. The reason for separate factors for salaried and hourly-rated employees is the different experience exhibited by the two groups as regards turnover and earnings increase. The adjustment factor reflects the slight adjustments determined by the actuary's annual valuation. The following actuarial assumptions are involved in the computation of the factors:

—It is assumed that the trust fund will accumulate interest at 3 percent a year, compounded annually.

—Estimated average earnings for the last five years of employment assume salary increases based on an earnings progression table.

—Allowance is made for terminations and deaths before retirement.

—Allowance is made for the cost of anticipated disability benefits.

—The 1937 Standard Annuity Table is used in determining anticipated life expectancy for retired employees, and special disability table is used in determining the anticipated life expectancy of disabled employees.

—The factors for cost reduction for social security benefits are computed by determining the value of the reduction under the plan formula and spreading this value over the period of service to retirement.

—Under the modified entry-age-normal-cost method, with the unfunded base being frozen, any future variations from the present experience used in computing the factors will be considered by annual adjustments to the gross benefit cost factor.

The Procedure for Determining and Allocating Costs

The procedure for determining the retirement plan costs and the subsequent allocation of these costs to divisions is summarized as follows:

1. Each division of the company reproduces its personnel tabulating card deck as of the fifteenth of each month. The reproduced cards include: division code, cost control unit number, clock number, date of birth, date of hire, sex, salary code and rate—monthly or hourly rate. The date of hire is defined as "date originally employed" with leave of absence and lay-offs as exceptions. Leave of absence remains in the tabulating card deck unless the leave is military, in which event the employee is considered terminated.

Upon return from military leave, "date of hire" is the reinstated date the employee was originally hired. The date the employee was originally hired is reinstated as "date of hire" also if the employee returns to work within one year from the date of lay-off.

2. Each division of the company forwards its reproduced personnel tabulating card decks to the central division tabulating department. This department (1) removes the cards for employees on the confidential payroll and forwards them to the treasurer's division, (2) calculates the pension cost for each individual, using the three applicable factors supplied by the actuary and (3) prepares separate tabulating card pension cost reports for hourly and salaried employees by division, overhead class and cost control unit, and produces summary cards for cost control unit totals, to be used by the central division tabulating department.

3. The treasurer's division (1) computes pension cost for confidential payroll employees, (2) prepares a summary report by division, overhead class and cost control unit of the confidential payroll pension costs and (3) forwards a copy of the report to the central division tabulating department.

4. Central division tabulating department: (1) prepares summary card for pension cost for each cost control unit from the confidential payroll summary report, (2) prepares separate tabulating card summary reports for the pension cost for each division, by overhead class and cost control unit, and produces summary cards for cost control unit totals and (3) forwards these reports and the summary cards to the treasurer's division by the 28th of each month.

5. The treasurer's division reviews and approves the reports, forwarding the reports and summary cards to the appropriate divisions for their use in making distribution of the pension cost to their cost control units.

6. Each division prepares a journal entry charging the overhead class, cost control unit and expense account for retirement plan expense and credits the accrued retirement plan account.

7. The following data is furnished the actuary in February of each year for the annual valuation:

    a. A reproduced deck of tabulating personnel cards (other than confidential payroll) used in the cost calculation for the preceding month of January.

    b. A schedule showing the cost calculation for the employees on the confidential payroll for the preceding month of January.

c. A tabulating card deck of punched cards for employees covered under the plan who terminated their employment in the previous twelve-month period, from February to January. The terminations are coded to indicate the type of termination, i.e., (a) retired, (b) disability, (c) death and (d) other.

8. Annually, the treasurer's division reviews the pension cost accrued under this procedure with the company's consulting actuarial firm and advises the board of directors of the amount of pension cost. The board of directors then determines the amount of financing to be done for the year and authorizes such amount to be paid to the trustee of the program.

Multiple Benefits

The accounting concepts and procedures discussed here have been successfully applied to our retirement plan. The benefits have been many. From an accounting standpoint, these techniques have provided more accurate product costings by applying pension costs as a part of direct labor burden. Another result has been more accurate reporting of monthly pension costs, eliminating the necessity for year-end adjustments. Improved departmental budgeting of pension costs and improved bidding estimates have also been related advantages.

One rather surprising result of this accounting method has been its effect on personnel relations. When the pension costs were put on an individual basis, employees became more interested in the plan as it personnally affected them. Better understanding and appreciation of the pension plan, particularly by supervisory personnel, were results.

Contrary to our original apprehension that the monthly computation of the pension costs on an individual basis might increase the accounting workload, it actually reduced it. Through making the process a routine monthly task, we eliminated the year-end push to prepare special reports required by the actuarial consultants.

These advantages bolster our belief that we have found a realistic approach to the problem of accounting for pension costs.

Getting the Most out of Operating Budgets

by PETER M. CHIUMINATTO

FUNDAMENTALLY the reason a business fails is because, for one reason or another, it cannot make the vital changes that would keep it alive. The reason, in most instances, is that management did not know or recognize the need for these changes soon enough to take the necessary steps to avoid disaster. However, the profitability of a business and its continued existence can be assured by the establishment of a proper system of budgets and forecasts because such a system serves as the ground rules for its operation. Comparisons between actual and budgeted expectations can be made on a daily, weekly or monthly basis to determine where variances occur, why they occur and what action is necessary by management to get back on the right track before permanent harm is done.

Budgeting is becoming more and more the accepted manner of operating a business and this paper is not intended to be a discussion on how to set up budgets but, rather, on how to make present budgets more effective so that management may do the following essential things better:

1. Plan the future course of action.
2. Assure the continuation of the business by better control of costs and expenses.
3. Solve its problems by advanced planning.
4. Know from time to time how it is making out as compared to the guide posts set up for the operation of the business.

The first fundamental of effective budgeting is to have a complete set of budgets covering the following items, as well as budgets on any other major expense or cost or policy which is important to management in the operation of the business:

Manufacturing costs	Research costs
Selling expense	Capital expenditures
Advertising & sales promotion	Inventory control

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Administrative expense
Financial expense

Sales volume & prices

When all these budgets have been accepted and approved they must then be summarized as to the financial effect upon the company. This summarization is accomplished by means of a *pro forma* profit and loss statement and balance sheet, together with a cash forecast which will show if and when money will be needed and whether for short term or long term.

Need of a Common Denominator for Cost Measurement

Proper designing of budgets to facilitate management decisions is a basic requirement for better and more effective budgeting. Because budgets, to be used effectively by management, must be set up in such a manner as to help in making decisions, accurately and quickly, on price and volume changes, product mix and cost and expense control, each budget, whether it be manufacturing, sales, advertising or any other area, has to be developed in terms of:

1. Common units of measurement
2. Variable and period costs
3. Areas of responsibility
4. A written plan

The common unit of measurement should be as stable as possible or it loses its common touch. In the manufacturing process, the common unit should be machine hours, labor hours, tons or units produced, so that variances in cost will be true variances and not confused with a unit that is one thing today and another thing tomorrow, such as labor dollars or material costs. However, the common unit may be different in each department or process.

On the other hand, for expenses which take place after, or apart from, the manufacturing process (such as selling, advertising, administrative, financial and research, or any other expense of this type), it is important to have an over-all unit of measurement, at least for each class of products and preferably for all products. This unit of measurement may be based on product weight, total cost exclusive of raw material, selling price or any other measure which will properly relate one product to another. In applying the measurement, a basis of 100 percent is usually given to the product of greatest sales volume and all other products are related to it on one of the bases indicated above.

If percentages are too difficult to handle, a point system can be devised. After the budgeted sales volume has been determined, it can be reduced to points for each product. An expenditure per point for each classification of expense can be arrived at for use in controlling expenses. This gets away from the percentage-to-sales figure now most commonly used and which is open to the criticism that variances may be caused by changes in selling prices, either up or down, and

by product mix which can increase or decrease the sales dollars. Variances from standard based on a point system will be true spending variances.

The Significance of Variable and Period Costs in Budgeting

It is important that management know which costs will not change regardless of volume and which costs change as the volume changes. Proper management decisions cannot be made unless the budget is broken down into variable and period costs. Variable costs are those which vary directly or almost directly with sales volume or manufacturing volume, such as direct materials, direct labor and direct supplies. Period costs are those which the company is expecting to incur for the period under review and are based on the volume of business expected. They consist generally of insurance, taxes, depreciation, heating costs, salaries, overtime, repairs, general expense and any other costs which are not classified as variable.

Most progressive companies do have their budgets broken down into variable and period costs but even these companies make two general mistakes. First, many have, in addition to variable and period costs, another type regarded as semi-variable. However, such an expense is impossible of controlling because, if there is a variance, no one can tell how to evaluate it. The solution to this problem is to do away with semi-variable accounts and make them either variable or period on one of the following bases:

1. Break the account, itself, down into its two parts and put the variable portion with the variable expenses and the period portion with the period expenses.
2. If it is impracticable to divide the account as indicated above, then determine whether it is more variable than period, or vice versa, and classify it according to its greater proportion. If this is necessary, the fact that it is done with a number of accounts will equalize the chances of error in total.
3. Make it a variable or period cost on the basis of management decision.

The second error is that many of the companies which have variable and period budgets do not extend the principle to the so-called distribution and administrative costs. Yet many of such costs are variable with the volume and many of them remain rather stationary regardless of volume. The period/variable principle should be carried through all costs and expenses to give management the true facts.

Classification of accounts is aided by adequate breakdown. Take, for example, advertising. Many companies either have one account for advertising or break

it into newspaper, radio, television and other. This is not sufficient for effective budgeting: A proper advertising account should, first of all, be broken down by product classifications if not by products, and then within each classification there should be a finer breakdown something like the following:

Newspaper	Special promotions	House samples
Radio	Sales allowances	Magazines
Television	Coupons	New accounts
Free deals		

If you have too many general accounts or groupings of accounts, you cannot tell why you have variances and that decreases the effectiveness of the budget. It is true that greater detail will give a larger chart of accounts, but it will be easier to set future budgets, determine causes of variances, place responsibility and expose all expenses to scrutiny.

There has always been the continuing argument as to whether or not costs classified as period should be shown on departmental statements. Those opposed say that the department head had no responsibility in originating the costs so he should not have to worry about them; those in favor of showing them say period costs are just as much a cost of operating the department as the variable costs and, as such, should be the responsibility of the department head. In my opinion, effective budgeting requires that both the variable and the period costs be on the departmental operating statement for these reasons:

1. The department head should be conscious of all the costs of the department.
2. Only in this way can the true effect of efficiency of production be related to reduced costs because, in some cases, the period costs are as great if not greater than the variable costs.
3. The department head usually initiates or approves salary changes, additions to salary staff, ordering of new equipment, increasing inventory, etc., all of which increase his period costs.
4. Only by knowing what his period costs are can a department head be in position to initiate or approve a change in operation or equipment and be able to compare the labor saving or increased production against the increase in period costs to be incurred.

Important Points in Controlling Costs

Unless a budget results in control of costs and expenses, it is useless. The most effective control is accomplished by comparing the actual cost and expenses with the budgeted costs and expenses on the most frequent basis practicable,

daily if possible, weekly if not, monthly if no greater frequency can be achieved. The objective is to know as soon as possible the difference between actual and budget, and make corrections with equal promptness. As a general rule, you should compare all variable costs and expenses, as well as production efficiency, on a daily basis and period costs as often as possible but not less than once a month. This control can best be achieved as follows:

Small Companies:

The department head should be close enough to what is going on in his own department to know if he is over or under and why. He can reduce his budget to a daily figure to facilitate the keeping of records.

Semi-Large Companies:

A plant cost clerk working directly under the department head can keep all the records necessary to ensure good control.

Large Companies:

The means of control are embodied in industrial engineers who have a man responsible for each individual major expense such as, electrical power, steam power, direct labor, waste and broke, production, repairs, etc. This engineer, in each case, is in constant daily contact with all department heads incurring his particular expenses and control is exercised from day to day.

In addition to these controls, it has been found very effective to take the larger period costs and allocate them to various senior executives who then have the particular responsibility of seeing what can be done with them in the way of cost reduction. Special studies on such items as salaries, manpower, depreciation, real estate and personal property taxes, insurance of all kinds, etc., can be very enlightening and many times result in reductions which were thought impossible.

Another effective use of the budget involves the manner in which variances are shown. In most cases the standard hours are multiplied by the standard allowance to determine the total allowance for any item of expense as compared to the actual expenditure. This method creates a variance which is composed not only of spending but also efficiency, and is very difficult for a department head to understand unless he is able to segregate it into its two component parts.

A more effective way to show variance for both top management and department head is to allow against the actual expenditure a sum equal to the actual hours multiplied by the standard allowance so that the variance is a true spending variance. Then, by taking all the standard allowances and multiplying them

by the difference between actual and standard hours, one will come up with the gain or loss due to efficiency of production. This figure on the individual operating statement and in total for all departments is very significant in the control which must be exercised.

After the variances are known and are broken down into spending, efficiency, etc, most effective budgeting demands that those responsible for the variances explain them. Although most accountants and controllers claim that it is up to their departments to not only compute the variances but also assume the responsibility of explaining them to top management, I believe that this is taking away the responsibility from the department head. He created the variances; he should know about them on a day-to-day basis and he should be the one to explain them. Effective budgeting requires that the controller's department compute the variances but stop there. The statements should then go to the department head, with copies to the divisional superintendent. The department head should immediately explain in writing to the divisional superintendent the reasons for his variances. His report should contain:

1. Reason for the variance.
2. A statement as to whether or not it will be made up before the end of the year.
3. Recommendation as to whether or not the standard be changed.

When all reports are summarized for all divisions, top management will know, not only the reasons for the variances but also how they are going to affect the profit forecast which has been based on standard and whether or not changes in the standards are needed. This is true control. It is more effective than having the controller do the explaining. The controller can do the explaining on variances for administrative and financial expenses but explanation of all other variances, be they manufacturing, selling, research, advertising, or what not should come from those who are spending the money and have the responsibility for living within their budgets.

Approaches to Better Budget Reporting

One of the largest fields for improvement and more effective budgeting is in the area of management reports. The most common complaint from executives is the timing of the reports. Timing takes in both frequency and issuance. The man in the basic operation wants his information "red hot." Top management can wait a little longer. If you have this problem of untimely reports, you can set up the problem as follows:

Classification	*Issuance Date*	*Order of Investigation*
Daily	No. of the report	Sales forecasts
Weekly	Department furnishing the information	Profit forecasts
Monthly	What working day it is due?	Cash requirements
Quarterly	How many copies?	Capital expenditures
Semi-annually	Who gets them?	Long-range forecasts
Annual		Research & development costs

Assign someone the responsibility of following up and seeing that each report is out on time. Require a reason for failures.

As operations expand, the area over which control is necessary also expands. Reporting should draw attention to only those items which are not going according to plan. Statements should be arranged so these exceptions are highlighted and brought to the attention of the responsible individual without a lot of searching and reading and expenditure of time. Next to reducing the number of figures to be reviewed come the reduction of the pieces of paper with figures on them. Each higher level of management should receive less detail and more summary information than the preceding level. This may be illustrated by the following sales department reports.

Individual	*Reports*
Salesman	Sales by products Sales by largest customers
Division manager	Division sales by products Division sales by salesmen
Sales manager	Total sales by products Total sales by divisions

If the sales of any product are off, the sales manager can tell what product and in which division it falls. By discussing it with the division manager, he knows which salesman or salesmen fell down. When the division manager goes back to the salesman, he can find out what customer or other cause resulted in in the decreased sales. However, it should not be necessary to go through this backing up process; it is required only when more than the routine information is necessary.

There is no necessity for adhering strictly to the dollar sign in contents of reports. If pounds or hours or some other measure means more, that is how the report should be made. In another direction, reports should show, where possible, how performance measures up to current economic trends or how the company is doing in comparison with others in the industry. Much of this data is available through the multitude of government statistics published at regular

intervals or from trade associations or from financial reports issued annually or quarterly. Comparisons of this sort may be best shown in figures. However, where it is necessary to show a trend, it is best to utilize charts and graphs. These are highly effective in presenting a story of what the trend is, and can demonstrate relationships which would take pages to describe.

No matter how effective your management reporting is, it will not remain that way unless there is a system or program of constant review. This is not a part-time job in an organization of any size. If you do not have the staff available, the job can be accomplished by hiring outside specialists in procedures and control techniques. The starting point for review is to summarize reports by departments and individuals who receive each. This will indicate with whom the reviewer must discuss the report to find out why he gets the report, the purpose it serves, and whether it:

1. Is doing what it was intended to do.
2. Can be revised to be more effective.
3. Can be combined with any other report.
4. Can be eliminated.
5. Can be issued less frequently.
6. Can be improved.

A periodic review of this sort will, in most cases, disclose duplication of effort, unnecessary reports, too many copies being made, obsolete reports, procedures which have not been kept up to date and reports which can be eliminated.

Reports Needed

Every business demands its own special reports and almost every management has different requirements depending upon the background of the individual report recipients and kind of business engaged in. However, regardless of these considerations, there are fundamental reports which are or should be common to all managements. They are as follows:

Sales forecast. This should be made monthly and show prospective sales by products on the basis of the common unit of measurement. The forecast should start with the actual sales for the period of the year already expired and continue with a forecast for the remainder of the year, so that the total of the forecast is the latest expectation of management. The forecast can be by months or quarters or a combination of both depending on the needs of the particular business.

Profit forecast. This should also be prepared monthly and should not only show sales by products on the basis of the common unit of measurement but should also contain the expected net profit per unit

and the total net profit for the units to be sold. This profit is then adjusted for variances from standard and for taxes to arrive at a net expected profit after taxes. Again the actual figures for the portion of the year expired should be shown, along with the forecast for the remainder of the year, so that the expected profit is management's latest judgment of what is going to take place.

Product profit forecast. This is a distribution of all budgeted costs and expenses to products and product lines so top management can see the net effect of all of the thinking and planning which has been done. It is kept current on a daily basis. An example is as follows:

	Product 1
Units to be sold	15,000
List price per unit	$15.00
Sales discount	.30
Net realization	$14.70
Factory costs	$ 6.00
Delivery costs	1.00
Sales commissions	.50
Selling and administrative	1.00
Customer aids	.10
Advertising promotion	2.00
	$10.60
Net profit per unit	$ 4.10
Annual product profit	$61,500.00

The items shown above can be expanded or contracted as desired but the principal purpose is two-fold:

1. To show the effect of any major item of cost or expense by product.
2. To have the report tie in with the total budget.

When this report has been completed, the total of each line for all the products should equal the total budget. When budgets have been changed, the report must be changed immediately.

Cash forecast. This is a monthly report which reconciles between cash position disclosed by the current balance sheet and the forecast balance sheet for the end of the period. Its preparation necessitates a reforecasting of the closing position each month. It will keep management currently posted on the following:

1. Additional cash requirements.
2. Why the additional cash is needed.

3. Whether the requirements will be long or short-term.
4. The months in which the shortages will occur.

Such a forecast will give top management ample time to make the necessary internal changes or plan to mitigate the cash problem if there is one, or at least enough time to think a solution through and make plans to raise the funds.

Comparison of actual costs with forecast costs. This must be done on a monthly basis and under the same classifications of accounts as are used in the product profit forecast. In this way management can tell from month to month where the costs on any particular product are out of line and either take steps to correct the situation or approve a change in budgets. It also tells if it is necessary to change the cost forecast, the cost basis on which decisions are currently being made.

Distribution expense statement. This is a monthly statement which applies all expenses except manufacturing to the various products on the basis of a common unit cost and compares this cost with the current budget as well as past years if so desired. This statement calls for many columns and many lines. The example below illustrates the format in an abbreviated manner:

	Sales salaries		*Sales traveling*	
Monthly basis	*M of $*	*Unit cost*	*M of $*	*Unit cost*
Actual 1958	40	.08	20	.04
Budget 1959	42	.06	21	.03
Actual 1959				
January	36	.05	19	.03
February	42	.07	23	.05

Statements of this nature keep top management informed on the progress of all expenses outside of the manufacturing groups on both a spending basis and cost per unit.

Reconciliation reports. These are reports which not more than a few concerns having budgets ever make out. They are two in number, one reconciling successive forecasts, the other reconciling forecasts with results. Whenever a forecast is revised or whenever the period of forecast has passed, there should be a reconciliation with the original forecast to bring to the attention of top management the following:

1. What and where the changes were which were required by a change in management thinking.
2. What errors, if any, either clerical or otherwise, were in the original forecast.

These comparisons help to improve the technique of budgeting as well as to apprise management of why the results did not measure up to the forecast.

Other reports. As indicated earlier, one of the effective uses of any budget is in developing the cash forecast. Generally speaking, the two items which have the greatest influence on the cash forecast outside of the profits of the company are the sums spent for capital assets and the money invested in inventory. Therefore, any system of effective budgeting should include reports to top management on capital expenditures and inventory position. However, these are subjects in themselves.

Budget Revision; Booking of Budgets

Another major problem of effective budgeting is keeping the budget current so that the information and reports derived from it are the last word based on current conditions. There must be a budget committee which meets at regular intervals and has the authority to approve or disapprove any suggested or requested changes and, when changes are made, to follow them through to see that they are put into effect immediately. The minimum membership on this committee should be the president, the vice-president in charge of manufacturing, the controller, the treasurer and any others with over-all responsibility. This committee must operate under established rules and procedures which involve the following:

1. All requests for changes must be referred to central engineering for their approval.
2. All requests for budget changes other than manufacturing must be referred to the vice-president in charge of the function involved for his approval.
3. After preliminary approval all changes go to the president for his approval.
4. After the president's approval the change must go to the budget committee where the approval must be unanimous or the request is rejected.
5. If approval is granted, it is made a part of the minutes of the meeting. The secretary sends the information to the individuals concerned so that the new standards can be put into effect at the proper time.

Along with this problem of changing standards comes the problem of how to handle the variances in the year-to-date column if that is the method of re-

porting. Assume a repair standard is increased from $1,000 a month to $1,500 a month in August. The year-to-date variance from January to August will be from a standard of $1,000 a month while the variance from August to December will be from a standard of $1,500 a month. There are three methods of taking care of this situation:

1. Show a total variance as well as a monthly variance and let the department head watch his new variance for a clue to how he is making out.
2. Show two variances, one from the old standard from January to July and another from the new standard from August to December.
3. Drop the year-to-date variance and just watch the monthly variance from the new standard on a monthly or accumulated basis from the date of change.

This brings up the big problem of whether or not the standards or budgets should be on the books of the company or whether they should be used as guide posts only. If they are put on the books, it is necessary to:

1. Accounts for all the variances.
2. Get the variances back to individual products.
3. Use the variance as a part of cost of manufacture or cost of sales, whichever you prefer.
4. Every change in standard or budget means going back and changing every departmental cost involved.

If you do not put the standards on the books, you:

1. Do not have any of the above problems.
2. Can change a standard every day.
3. Instead of working from standards, you work from actual costs.

Effective budgeting, in the opinion of a good many people who have spent a life-time in the work, demands that the standards be put on the books. This procedure shows the variances in their true character, which is an increase or decrease in costs over what they should be. The variances actually have to be taken into account by increasing or decreasing the monthly profit and this, it is said, causes management to pay more attention to the budgets. The foregoing relates to attainable standards or budgets.

There is a case for not putting standards or budgets on the books when they represent ideal conditions. Ideal standards have their place in management and some businesses use them as a guide to what it is possible to accomplish. In

some cases additional bonuses can be established for accomplishments over and above attainable budgets. Relationships might be as follows:

	Units		
Actual production	600	% to attainable standard	120%
Attainable standard	500		
Ideal standard	900	% to ideal standard	67%

Budgets and standards, set at ideal levels, while not on the books because of their nature, indicate to management how much more it is practicable to push for and the area in which paying additional money for additional effort might be worthwhile.

No Tool Useful Unless Used

No matter how much it is possible to get out of budgets by using them effectively, it is to be remembered that budgets are not an automatic answer to all business problems and worries. Budgets are only as good as the thought put into them, the facts on which they have been built, their acceptance with the related standards, by those who have to live with them and, most of all, the interpretation placed upon the variances.

Any budget is a living thing and needs constant change, sometimes from day to day. Too many managements make the mistake of putting together a budget and letting it stand for a year or six months, accumulating variances which have no meaning because of changed conditions. To make any system of budgets most effective, there must be a continuing process of comparison of forecast to forecast and actual to forecast in order to incorporate latest developments in the economic picture or management thinking.

More Light on the Accountant and His Company's Insurance

by ANTHONY L. CARLUCCI*

IN THE ARTICLE "What Is Your Insurance I. Q.?" (*N.A.A. Bulletin,* October 1959), John B. Thompson, presented a fine description of basic industrial insurance coverages together with short classifications and descriptions of the more common insurance carriers. He also pointed out the importance of the accountant in the insurance program of a business organization. However, a misconception may be left with the reader regarding the description of mutual and reciprocal insurance companies. The purpose of this letter is to clarify, and to accentuate the importance of the role of the accountant in his company's insurance program.

The author, in his description of mutuals and reciprocals, stated that policyholders who purchase insurance with an assessment clause may be liable for additional premiums if the operations of the company result in a net loss. The truth of the statement depends on the interpretation of net loss. It is possible for an insurance company to end a year with an underwriting loss and, at the same time, produce a financial statement showing a profit from overall operations for the same year. This is due to the fact that properly managed companies earn sufficient investment income from invested reserves to more than offset any underwriting loss. The excess investment income over underwriting loss provides an increase in the company's surplus. In this situation, then, an assessment from the policyholders is not needed. This is an important point in view of the heavy underwriting losses many companies are reporting today, particularly in the casualty insurance field. The extent of these losses, however, is not necessarily cause for alarm.

It would be more proper, then, to say that, when an insurance company's resources have been nearly or completely exhausted, it will be forced to call upon policyholders holding assessable policies for an additional premium, in accordance with the terms of the insurance policy. Consequently, this opens the door to the importance of the accountant in not only protecting the assets of his company with adequate insurance coverages but also determining the financial strength of the selected insurance carrier or carriers.

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Having recognized the hazards and securing insurance to cover the risks—important as these matters are—does not add up to a thorough job of protecting the business; the accountant's responsibility concerns also the evaluation of the financial stability and strength of the insurance company or companies selected to provide the necessary coverages.

The fact that insurance companies are examined periodically by state insurance departments does not necessarily eliminate the important task of the accountant to review annually the operating results of the insurance carrier. It has been known to be true that, in some instances, an insurance company showing an unfavorable trend in its operations has been ordered to suspend its operations much later than it should have been. As a result of the forced suspension and liquidation, many unpaid claims were either partially settled or not at all, depending upon available resources. Just as mercantile establishments are rated by Dunn & Bradstreet, so are insurance companies rated for stability. The Alfred M. Best Company, Inc., with its central office located in New York City, annually publishes comparative five-year condensed financial statements of as many as 1,200 insurance companies.

In analyzing the underwriting operations of a company, two ratios are used. One is the ratio of combined losses and loss adjustment expenses incurred to earned premiums; the other is the ratio of underwriting expenses incurred to written premiums. Profitable underwriting is indicated if the two ratios total less than 100 percent. When the ratio rise above 100 percent, an underwriting loss is the effect. The extent and severity of the loss depend on how high over the 100 percent the ratios climb. The underwriting ability of the management of an insurance company is determined by these ratios.

Another important ratio the accountant should compute is the ratio of surplus to assets. A healthy surplus provides a cushion for absorbing abnormal losses from underwriting or shrinkage in value of investments. A declining surplus reduces the ability of the company to absorb unusual shocks. This is an important factor to consider when evaluating a company which issues assessable policies. As mentioned earlier, an assessment is more likely when a company's resources are approaching the point of exhaustion.

The economy of management is measured by a ratio of expenses incurred (excluding claim expenses) to premiums written. The expenses referred to are those incurred in writing policies, administration expense, payment of commissions, etc. The lower the ratio, the more control the business has on these particular items.

The analyzing of financial statements as outlined above will also prove that the size of an insurance company

is not always the safest rule in measuring its stability. A company with smaller premium volume and smaller assets can be just as safe as a giant with a larger premium volume and tremendous assets.

In analyzing financial statements, the accountant will find himself in a more familiar area of activity than he would be in trying to digest the complex coverages, conditions and exclusions found in an insurance policy. By evaluating the stability of insurance companies through the analysis of financial statements, and familiarizing himself with basic insurance coverages as stated by Mr. Thompson, the accountant will certainly enhance his value and importance to his organization.

Training Supervisors to Control Clerical Costs

by VINCENT A. PIUCCI

OUR INITIAL APPROACHES to means of clerical cost control produced sufficient evidence to indicate savings potentials of a magnitude to make the objective worthwhile. The problem we faced was to discover the reasons why so many initial applications failed to achieve the full potential, and then devise a program which would avoid, or at least minimize, the pitfalls. Two years ago we embarked on our program. We believe that we have discovered the key to the problem and today we point with pride to a program which is firmly established as a part of our daily operating procedures, has produced better informed, more effective supervisors, and is currently saving us at the rate of more than $400,000 a year.

Savings of this magnitude, which we believe to be both substantial and spectacular, suggest that we have discovered a truly effective method of controlling clerical costs. We think that, to begin with, we were as good as the average insurance or industrial company, maybe even better. We had utilized most of the management techniques, such as work simplification, supervisory training of various kinds, forms control, etc., as well as being highly mechanized. In fact, Best's Insurance Reports, an organization which publishes comparative ratings of insurance companies, gave us a rating of "excellent" as to expense ratio. We are convinced that the success which has been achieved must be credited to the program which we installed and the manner in which it is being carried out.

Problems of the Supervisor Uppermost

Nearly all clerical cost control programs are based on work measurement. Ours, which we call the supervisors work analysis program, is no different in this respect, although, probably, unique in its concept, approach and philosophy. The program is an integrated program in which supervisors are trained to control output by utilizing work measurement as the basic control tool. Savings are automatically achieved by:

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1. Training supervisors in the techniques and use of work measurement.
2. Measuring the work.
3. Using these techniques in controlling output.

The emphasis is placed on the problems of the supervisor in the daily management of the work. He is brought directly into the program and participates in the establishment of work standards, thus alleviating his fears and suspicions of the standards. At the same time, he is taught how to utilize the standards to help him solve his daily problems of planning and scheduling.

Most of the material written about work measurement has been concerned with technique and the relative value of one technique as opposed to others. While technique is important in relation to the objectives, it is of little value when used alone. Perhaps it informs you that you have approximately 20 percent more clerks than are needed to perform the work. All that would seem to be necessary would be to walk through your offices and fire every fifth clerk! If you did this, you would create chaos, bottlenecks, backlogs, and eventually have to rehire everybody.

What, then, is the answer to this problem? The answer lies in that old time-worn cliché that, "the first line supervisor is the key to control of costs." Unfortunately, most supervisors do not truly supervise. This is not their fault, since most of them have not been given the tools or the training required to do a management job. For example, the typical supervisor gets his job primarily because he is the best clerk in the section, the one that consistently out-produces the others. He is given a short course in human relations and then told, "You are now a supervisor. We now expect you to do a management job." Somehow, this is expected to come about by magic formula. What really happens? He knows he got the job because he was the best clerk. Therefore, he must now continue to prove that he is the best clerk. The result—he becomes the bottleneck; he does most of the work; he wishes the other clerks would not bother him because he is too busy. After awhile they oblige and go unsupervised because he has no time for this function. No one has taught him how to manage the work.

Supervision is Managing Time

This situation points to the solution of the problem. Obviously, if a supervisor performed his function of supervision completely and fully, nothing else would be required since he would be getting the work done in the most efficient manner and with exactly the right amount of clerical help. Therefore, if we

could help the supervisor carry out his responsibilities, if we could help him measure and evaluate the effectiveness of the way he does his job and provide a means of determining the causes of low effectiveness, we would have discovered the key to clerical cost control and reduction.

In examining the problems of a supervisor, it will be found that the one tool he does not have or else does not use for his job is time. First-line supervisors and department heads are constantly faced with synchronizing and planning for as many as fifty different tasks, carried on simultaneously by as many as twenty or thirty different clerical workers. How can he do this unless he is prepared for the task of management? An analysis of the requirements of good supervision from the standpoint of management of the work requires the accomplishment of at least these six points:

1. Better planning and scheduling.
2. Balanced work loads, to eliminate bottlenecks.
3. Accurate determination of manpower and equipment needs. (How many supervisors can give a satisfactory answer to the question, "How do you know you need another clerk?")
4. Accurate evaluation of the performance of subordinates.
5. Evaluation of alternate methods of doing the work.
6. Increased over-all effectiveness.

It is necessary to know how long it takes to complete each of the various clerical processes before any informed, truly effective action can be taken in the determination, control, and reduction of clerical costs. Therefore, work measurement logically becomes the basic control tool in such a program. Unfortunately, work measurement has been tinged by the unpleasant memories of efficiency experts in factory operations. Supervisors resent being told by some "expert" how to run their operations and clerks resent being subjected to stop watches or a battery of spies observing their every movement. These objections must, therefore, be overcome.

In an effort to determine the proper course to follow, we invited a number of management consulting firms to present proposed programs to us. In studying these proposals to determine which of the many techniques and approaches would best suit our requirements, minimize the risks and maximize the savings, we arrived at two conclusions:

1. The use of predetermined elemental motion-time values would provide a more scientific and accurate basis for:
   a. Planning and scheduling work
   b. Balancing work loads
   c. Determining manpower and equipment needs

d. Evaluating performance
e. Evaluating alternate methods of doing the work
f. Aiding clerical personnel to be more effective

2. The approach used by one management consulting firm (whose assistance we retained) appealed to us because, in addition to using predetermined time values, its program minimized the risk of supervisory resentment by emphasizing the supervisor's part in the program and making it each individual supervisor's own program.

Predetermined elemental motion-time values are units of time required to perform a specific operation. These units have been developed after years of study and research. They represent the amount of time it should take to perform a given operation by a person who is (1) qualified to do the job, (2) properly trained for it and (3) working at a "normal" pace. The values are then increased by a factor (we decided on 15%) to allow for personal time, fatigue and unavoidable delays. Work standards developed by use of these predetermined values are dependent upon steady application of average clerical speed and effort for achievement. A speed-up is neither required nor desired to result in effective utilization of time.

The Training Program — Organization and Content

With the assistance of our consultants, the supervisors' work analysis program was conceived and put into operation, the implementation phase being scheduled to cover a fourteen-month period. The number of analysts required to install such a program depends upon the number of supervisors whose sections are to be measured and the speed with which the installation is to be completed. In our case, with sixty supervisors going into the program and with a fourteen-month schedule for the installation, three analysts were required.

During the first twenty-two weeks, the three analysts were completely trained by the consultants in the basic techniques of work measurement and in the special techniques of flow charting, statistical analysis, and the application of predetermined motion-time values. The training was in the form of classroom instruction and workshop training. Each analyst was assigned two selected supervisors and worked two days a week with each one, flow charting, analyzing, and measuring the work in the supervisors' sections. Obviously, these particular supervisors were selected because of their experience and known attitudes of cooperation.

Concurrently, during this period, the remaining fifty four supervisors were trained by the consultants in the same basic techniques. By the end of this

period, the analysts were fully trained and had gained actual experience in work measurement. The supervisors also had been trained, had prepared flow charts of their operations and had statistically analyzed the frequency of various units of work, and were awaiting assistance of the analysts in the development of the time standards.

In the course of the next nine months, the supervisors, with the assistance of the analysts, completed the measurements and established the standards. We have since found that the training process can be substantially reduced. For example, last fall we trained two new analysts in a concentrated two-week period. Also, we trained 13 new supervisors in 10 three-hour sessions as compared with 22 three-hour sessions in the original program.

The training program attended by the supervisors is divided into seven major parts:

1. *Identifying processes*—This is nothing more than the determination of the different jobs carried out in the section. A job for this purpose would not be a skill like typing, filing, etc., but would be a function like billing, which would include the receipt of the source material, typing the bill, forwarding the various parts of the billing form, filing the department copy, etc. An estimate is also made at this time of the amount of time spent on this job. This is done to determine the relative importance, time-wise, of each job so that a disproportionate amount of time will not be spent measuring minor jobs.

2. *Describing operations*—The supervisor is taught the techniques of flow charting and, using these techniques, he flow-charts in complete detail the process followed in each job. In the course of flow-charting, certaining desirable changes in the procedures become evident and can be corrected immediately. Therefore, a limited amount of work simplification does take place at this point. Also, by the time the supervisor has completed his flow charts, he knows more about the operation of his section than he has ever known before.

3. *Establishing standards*—The supervisor is taught how to apply the predetermined elemental time values to the flow chart in order to establish the standards. However, the actual measurement is a co-operative effort of the supervisor and the analyst, thereby assuring a measure of uniformity in the establishment of the standards. Nevertheless, the supervisor's sharing in the establishment of the standard is important, because it becomes his own standard rather than a standard imposed on him. His fears and resentment are thereby avoided and, since he has participated fully in the esablishment of the standards, he cannot doubt their validity.

4. *Determining effectiveness*—The supervisor is taught how to calculate the total standard hours required for each job by multiplying the units produced by the standard time required to produce the respective units. This total is then divided by the actual hours utilized, and the rate of effectiveness determined. Although the supervisor is warned at the beginning of the course that he should not expect to be any better than 60 percent effective, the low rating resulting from this first calculation becomes a shock. Usually, he finds it difficult to accept the initial rating and immediately begins a complete audit of the flow charts and calculations. Once he has convinced himself that the standards are accurate, he begins to plan improvement.

5. *Planning Improvement*—This is the payoff. It is only through this planning and the proper execution of the plans that a supervisor can improve his performance. Of course, in the final analysis, only two things can improve performance ratings. Either the staff must be reduced or the volume of work done increased. Since we normally cannot control the volume of work, control must come about through reduction in staff. This was achieved through normal attrition resulting from turnover.

   The first step in planning for improvement is to prepare a chart showing the various tasks and the time required to perform these tasks, by position. This will immediately tell where over or understaffing exists and the effectiveness with which the total time in each position is utilized. Now, if it is found (and it will be) that extra time is available at various positions, certain possibilities are open depending upon the circumstances:

   a. *Job combination*—Work performed by two clerks, which in combination does not exceed 80 percent or 85 percent of the available time, may be combined and performed by the same person.

   b. *Work reallocation*—Let us assume a group of five persons with a low effectiveness rating. Perhaps the work of one could be spread over the other four.

   c. *Work resequencing*—As a means of improvement, work can frequently be performed in a different order so that what is normally done at a later time can be done earlier. Work resequencing can be applied not only within a section but also between sections or departments. This procedure can usually overcome problems occasioned by hourly peak loads or tardiness in the receipt of needed paperwork from some other area. It avoids holding large staffs in readiness to process peaks in paperwork, and economies can result.

d. *Group realignment*—Under some circumstances, jobs can be done better and more quickly in some other section.

e. *Comparison with individual clerk time*—It is seldom found that individual clerks do not desire to work at a normal pace; however, upon occasion, personality conflicts or other reasons may cause performance far less than average. When such a case is suspected, it is possible to calculate individual performance. Most clerks, however, welcome the opportunity to keep busy if the work is made available.

6. *Reporting results*—Each month the supervisors prepare their own reports and calculate their performance ratings. These reports are forwarded up the line to their superiors as a record of achievement. In addition, supervisors are asked to forecast their expected performance rating over a six-month period and to prepare a written report on how they expect to achieve the indicated improvement. This accomplishes two purposes. First, it requires supervisors to plan and, second, it gives them a goal.

7. *Controlling production*—Finally, our supervisors are taught how to keep their production under control daily to assure a high performance rating at the end of the month. A simple method of controlling the work is by utilizing a process known as "short-cycle scheduling." This is accomplished by recording the receipt of the work at some focal point as soon as it is received in the section, and converting it into the time required to complete it, using the standards. The work can then be assigned in small-lot batches and its return asked for by specific time. For example, a small batch of work, with a time value of one hour, assigned at 9:00 a.m. should be expected back by 10:00 a.m. This control record will immediately warn the supervisor if work is not progressing satisfactorily.

The technique of establishing work standards, outlined in the above seven points, has been skipped over rather lightly. To put it simply, all that is required is to:

1. Identify the work units. What is the work being done which can be classified as one unit?
2. Establish the work count. What is it that triggers off a unit of work (usually, some piece of paper, such as a sales order, a payroll change notice, a purchase request, etc.)?
3. Develop the unit time. Every time one of these work units is triggered off by the item which is to be counted (sales order, for example), how much time should it take?

Now all that is required is to count the number of items processed and multiply this number by the unit time, resulting in the standard time required to

process the work. Divide this figure by the actual time spent and the result is the effectiveness with which the work is performed.

The Measurement Method We Used

Standards can be established by a number of different measurement techniques, and many will rise to the support of techniques such as ratio delay, stop watch, time ladder, historical standards, batch methods, etc. We have used some of these methods to solve problems where it was not feasible to use predetermined standards but we use predetermined standards where possible for these reasons:

1. They are generally more accurate than most other methods.
2. They are faster and easier to install because the standards were available to us through our consultants.
3. The cost is less because of the decreased time of installation and earlier realization of the savings which more than offsets the out-of-pocket cost for consultants.
4. They can be used to measure the work without the necessity of observing or stop-watching the clerks. Supervisors receive their training and develop the time standards in a special area set aside for this purpose, minimizing the disturbing influence work measurement may have on the clerical staff.
5. When changes in procedure occur, the standards can be easily and quickly altered without the necessity of having to re-measure the entire job.

How the Supervisors Were Helped to Supervise

Earlier in this paper, six requirements of good supervision were listed. It seems appropriate at this time to see just how this program helps a supervisor to meet those minimum requirements:

1. *Plan and schedule work*—By determining volume of work to be done and by applying the standard time required to do this work, it can be determined how long it will take to do the work required. It can then be planned and scheduled in terms of man-hours available for completion within the required time. Also, project and work commitments can be made more intelligently and with more confidence.
2. *Balance work loads*—The same technique can be used to determine whether work loads are in balance, either by individuals or by groups. If indicated, appropriate action can then be taken.

3. *Determine manpower and equipment needs*—By applying the standards to the volume of work expected and comparing with available man-hours, manpower and equipment needs can be forecast and, more importantly, substantiated.
4. *Accurate evaluation of the performance of subordinates*—When circumstances warrant individual evaluation, records of units of production can be maintained for each clerk. Application of the standards to individual production will permit ready evaluation of individual performance. Even more important is the evaluation of the supervisor. He can be evaluated by the overall performance of the section for which he is responsible. This is naturally done through the medium of the reporting function which is the yardstick by which actual performance is measured against planned results.
5. *Evaluate alternate methods of doing the same work*—When procedural or methods changes are recommended, an estimate of savings usually accompanies the recommendation. The accuracy and, sometimes, the very existence of any savings may be questionable. However, by charting the recommended change and by applying predetermined motion-time values to the operations, an accurate cost comparison can be made.
6. *Increased over-all effectiveness*—This is the natural consequence of proper execution of the first five points. When this has been accomplished, clerical cost control and reduction have in fact become a reality.

Gains — and More in the Future

In conclusion, the primary goal of an effective clerical cost control program is not savings, nor is it the establishment of work measurement to provide an impetus for a general speed-up which, of itself, could be both dangerous and unproductive. The primary goal is better management which, if achieved, automatically brings about a proper relationship between work performed and manpower used. Such a proper relationship will save just about any company 20 percent or more of its clerical costs. In addition, there will be gained the many intangible benefits which are a natural consequence of a more effective, better informed supervisory team,—and the key is a program which trains supervisors in control of output.

Currently, we are embarking on the second phase of this program. Not within the scope of of this paper, it may, nevertheless, be of interest in that it will provide us with the basic requirements for better cost information. We shall be able to distribute costs more accurately by lines of business, by products and by functions. This should lead to further cost control and savings.

Equitable Allocation of Home Office Expense

by RAYMOND K. LOESTER*

As THE TREND toward decentralization in management and operations continues, the method of allocating home office expenses to the various divisions becomes increasingly significant.

In establishing a workable method of allocating central office expenses to divisions, certain elementary concepts should be scrupulously observed: the plan should be simple to follow, easily understood by the divisional personnel involved, have a sound mathematical basis so that it can be consistently applied to the various divisions, and honestly and accurately interpreted and maintained. Any plan that is deficient in any of these stipulations can result in failure. Any situation in the relations between home office and divisional personnel which creates doubt, uncertainty, confusion or lack of interest can have only negative results.

Our organization, consisting of twenty-seven recently decentralized operating divisions, has devised an interesting method of allocating expenses incurred by the home office to all divisions. We use two measures, namely "assets committed" and "ability to earn."

Under the first yardstick, assets committed, an initial determination is made of partial charges to the various divisions. This is calculated by applying a 5 percent a year interest charge to the book value of all assets assigned to a division at the close of the fiscal year. This interest on investment is then charged to the particular division in the following year on a prorated monthly basis. Its total, so allocated, is deducted from the total home office expenses to be apportioned to the divisions, and the remaining expenses are charged on the basis of "ability to earn", depending on gross profit margin, which is governed either by traditional market conditions or the very nature of each of the three distinct types of our company's operations. Because of the variation in gross profit margins, an ability-to-earn formula was developed which weights the estimated dollar sales for the coming fiscal year, so that all estimated dollar sales can be reduced to a common denominator, and a uniform rate per equated sales dollar applied in allocating the remainder of home office expenses for the ensuing fiscal year.

We have found that this plan has received a high degree of acceptance among divisional operating personnel.

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An Introduction to Pipe Line Accounting

by H. D. GEIGER

PIPE LINES are the plumbing of the oil industry. They are plant facility by nature, common carrier by law, and a combination of the two in practice. Pipe lines are expensive to build and require a large initial investment. The trend toward automation has increased considerably the investment per employee, as evidenced by a fully-automated crude oil line having an investment of more than $500,000 per employee. Pipe lines are now moving approximately 95 per cent of the domestic crude oil all or part of the way to the refineries and 40 per cent of the products from the refineries to the markets.

The organization charts of pipe line companies are similar to those of industrial companies, except that, normally, they do not need a sales department. The sales function is usually handled by the top executives with an "assist" from the oil movements or dispatchers' department.

The financial statements and accounting records of an interstate common carrier pipe line must conform to the uniform classification of accounts prescribed for pipe lines by the Interstate Commerce Commission. Financial statements for internal use may be prepared in such form as management desires but reports to the Commission must comply with the prescribed form. The I.C.C. compiles statistical information about the industry and, in order for this information to be meaningful, it must be prepared from various uniform statements and reports. The Kansas City Southern Railway once challenged the commission's right to prescribe a system of accounts for steam railways but the U.S. Supreme Court held that, "the very object of a system of accounts is to display the pertinent financial operations of the company and throw light upon its present financial condition . . . it is necessary that the accounts of several carriers shall be arranged under like headings and titles . . . the same with one carrier as another."

It is not the purpose of this article to discuss in detail the chart of accounts for pipe lines. The chart of accounts may be obtained from the Interstate Commerce Commission. The instructions included with the chart are brief, clear and to the point. Important terms are defined. However, major items in the chart of accounts which are peculiar to pipe lines will be reviewed here briefly.

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Property Accounts and Depreciation

Carrier property accounts are divided into three primary classifications—gathering lines, trunk lines and general. The primary accounts are sub-divided into descriptive classifications denoting use. The primary accounts with their subdivisions and account numbers are as follows:

Account No. 1

Gathering lines	*Trunk lines*	*General*	*Description*
101	151	171	Land
102	152	—	Rights-of-way
103	153	—	Line pipe
104	154	—	Line pipe fittings
105	155	—	Pipe line construction
106	156	176	Buildings
107	157	—	Boilers
108	158	—	Pumping equipment
109	159	179	Machine tools and machinery
110	160	—	Other station equipment
111	161	—	Oil tanks
112	162	—	Delivery facilities
113	163	183	Communication systems
114	164	184	Office furniture and equipment
115	165	185	Vehicles and other work equipment
116	166	186	Other property
—	—	191	Construction work in progress
—	—	192	Unadjusted investments
—	—	193	Aquisition adjustment

Pipe line construction includes "items used in protection of oil pipe lines applied directly to or around the pipe, such as casing pipe and vent lines, concrete, bituminous coatings, etc., and teaming labor expended in excavating, connecting up pipe lines and back filling. It also includes the construction of scraper and other pipe line pits which do not include an above-ground building and the damages to crops and timber and other damages incident to construction of pipe lines."

Pumping equipment includes the engines that drive the pumps. Other station equipment includes manifolds, refrigeration equipment and miscellaneous fittings and equipment.

Other property "includes the cost of property used in pipe line operations not provided for elsewhere." Some companies charge interest and taxes on construction to this account instead of prorating them to the various property accounts.

Construction work in progress includes the cost of construction of carrier property not completed or ready for service at a balance sheet date. When a construction project is completed, its cost is "charged to other primary accounts of this classification appropriate, according to the character of the property." The construction work in progress is sometimes divided into sub-accounts bearing the same number as the primary accounts into which the costs eventually will be closed. For example, construction and installation costs of trunk line pumping equipment would be accumulated in account number 1-191-158. When the job is completed, the accumulated costs would be transferred to account number 1-158.

Interest and taxes applicable to carrier property construction are capitalized although they are deductible for income tax purposes.

Control over construction expenditures is maintained by the use of documents usually entitled, "Authorization for Expenditure" (AFE). This is used to describe briefly the over-all project and estimates of the various costs, and bears the approval of responsible officials. Some companies require approval by the Board of Directors for projects costing over a specified amount. Company policy may require additional authorization if costs exceed ten per cent of the original amounts authorized.

Depreciation is defined by the uniform system of accounts as:

> "loss in service value . . . not restored by current maintenance and incurred in connection with the consumption or prospective retirement of physical property in the course of service, from causes against which the carrier is not protected by insurance, which are known to be in current operation and the effect of which can be forecast with a reasonable approach to accuracy. . . . Among the causes which may result in the loss of the service value of depreciable property are physical depreciation, obsolescence, inadequacy and decline and exhaustion of the traffic which the property was designed to transport."

The Interstate Commerce Commission prescribes composite annual depreciation rates for each primary account. These rates are computed as follows:

$$\frac{\text{Book cost} + \text{cost of retiring} - \text{salvage value}}{\text{Estimated service life (years)}}$$

Depreciation is accrued monthly by applying one-twelfth the composite annual percentage rate to the balance of the applicable primary account at the close of the preceding month. These amounts are charged to accounts 613,663 and 763, which are, respectively, depreciation expense for gathering lines, trunk lines and general clearing accounts. The depreciation expense is adjusted during the last month of the year so that it equals the total of the individual composite rates

times the average investment in their respective property accounts. Account 74, accrued depreciation—carrier property, is usually sub-divided into accounts having the same description as its related primary account and the same number, except that the hundreds digit is a "2". Thus accumulated depreciation for gathering line tanks would be designated as account number 74-211. Land, construction work in progress, unadjusted investments and acquisition adjustment accounts do not relate to depreciable assets.

The uniform system of accounts states that rights-of-way are depreciable assets. The economic lives of rights-of-way are approximately the same as the line pipe. The Internal Revenue Service has not followed this line of reasoning and has maintained consistently that rights-of-way are like land, and thus not depreciable.

Retirements are recorded in the usual manner for property depreciated at composite rates. The asset account is credited and the applicable accrued depreciation account is debited with the original cost of the asset retired. Concurrently, the accrued depreciation account is charged with the cost of retiring the asset and credited with salvage proceeds, or with salvage value if the retired assets are taken into inventory of materials and supplies.

Various salvage values are assigned to carrier property that is retired and placed in material and supplies inventory. The engineering department may assign a fair realizable value or the property may be valued at its depreciated value. Some companies assign a salvage value of 65 per cent of original cost to complete units retired, such as pumps or motors, that still have a useful life. Such items are then carried in material supplies inventory at this value and, when restored to carrier property, are recorded in the primary accounts at original cost.

Some carriers use different depreciation rates for tax purposes than for book purposes and have permission to amortize certain properties (or an approved percentage of such properties) over a sixty-month period as emergency facilities. The uniform system of accounts does not provide for deferred tax accounting where book and tax depreciation rates are different.

Material and Supplies

The prescribed chart of accounts states that materials and supplies

> "shall include the balances representing the cost, less depreciation, if any, of all unapplied material and supplies, such as shop material, articles in process of manufacture by the carrier, fuel and pipe line supplies. In determining the cost of material and supplies, suitable allowance shall be made for all discounts allowed in the purchase thereof and any transportation charges paid for transporting the material from the point of free delivery are added.

> "Material recovered in connection with maintenance work or the demolishing of carrier property shall be charged to this account on the basis of its value as recovered. If the material is reconditioned the cost of reconditioning shall be added to the value of the material as recovered. . . . When scrap material is sold at a higher or lower price than that at which it is included in this account, so far as practicable, an appropriate adjustment shall be made in the accounts which were credited when the material was recovered and taken into the material and supply account."

Pipe line companies generally maintain duplicate inventory records. Each warehouse maintains perpetual inventory records of its material and supplies and the combined material and supplies are usually recorded in the central office as well. The warehouse records are quantitative only, whereas the master records include price data. Maintaining a master inventory record provides necessary information for inventory control and a means of readily locating a scarce item within the system.

Operating Oil Supply; Pipe Line Allowances

The uniform system of accounts defines an operating oil supply as "the cost of oil owned by the carrier and used to maintain lines and storage tanks in condition for the transportation of commercial oil." The operating oil supply is usually valued at cost. In the case of operating oil supply acquired as a part of the pipe line allowance, cost may be the transportation charges paid to the preceding carrier, if any. However, very few companies today acquire and maintain voluntarily an operating oil supply, contending that, so long as shippers continue to tender oil for shipment, they can make delivery in the normal course of business. If necessary, they can use water to fill the lines and thus make the required deliveries.

When a pipe line company transports a variety of petroleous liquids for various shippers, it is extremely difficult, if not impossible, to determine which shippers' oil, and how much, evaporated or was lost in transit. In order to simplify or eliminate this problem, pipe line companies have established two types of tariffs. One type of tariff (sales prices) guarantees that the shipper will receive the same number of barrels of oil that he tenders. Since the carrier assumes all losses from evaporation, leaks or breaks, the transporation rate per barrel will include an amount sufficient to cover estimated losses. This type of tariff is used principally by products lines but not crude oil lines.

The other type of tariff allows the carrier a shrinkage allowance, hence, it is usually less than the tariff mentioned above. This allowance is usually one per

cent of the oil tendered to the originating carrier. The allowance is divided among the participating carriers in the ratio of the miles of their lines to the total miles of the movement. The pipe line companies' tariff guarantees a specified quantity of oil to be delivered, whereas other forms of common carriers are allowed, in their tariffs, a specified shrinkage before claims can be filed against them for shortages.

The uniform system of accounts is silent as to how the pipe line allowance is to be valued in the accounts of a carrier. Some carriers solve the problem by selling the accumulated allowance each month to one of their shippers. Other pipe lines companies record it at the transportation cost of the oil. The principal advantage of this method of valuation is that no profit is realized nor income tax liability incurred until it is sold. Companies which value the allowance oil at market immediately realize a substantial profit and incur a related tax liability.

Reports Required by the Interstate Commerce Commission

Pipe line companies with annual revenues exceeding $500,000 are required to file quarterly reports of traffic statistics with the Interstate Commerce Commission. Each report, due within thirty days after the close of the quarter, compares the carriers' transportation revenue (accounts 501 and 551) and barrels of oil originated and received from connections, with that of the same quarter for the preceding year. The reports of the individual companies are combined and published by the commission's Bureau of Transport Economics and Statistics.

A voluminous annual report containing financial, operating and statistical information is filed on a calendar year basis and is due within ninety days after December 31. Detailed instructions are included throughout the report, which contains much of the information that would be included in an independent auditor's long-form report on examination of financial statements—and more.

There are also valuation reports. Pipe line tariffs and rates must be just and reasonable, both to the shipper (or public) and to the carrier. The Interstate Commerce Commission is charged with the responsibility of setting transportation rates which provide a fair return to the carrier. This return is based upon the valuation of the carrier property, as determined by the commission. In order that the valuations may be as current as possible, it is the practice of some carriers to provide the personnel necessary to bring their valuations down to date for approval of the commission. This timely information is of special interest because of restrictions imposed by an influential judicial action, known

simply throughout the industry as the consent decree, the provisions of which will be discussed in a later section of this paper.

Final valuation consists of the valuations determined for physical property, land, rights-of-way, working capital and intangibles. Three values are considered in arriving at a valuation for physical properties. These are original cost, reproduction cost new and reproduction cost new less depreciation. Land is stated at present value as determined by appraisers for the commission. Rights-of-way are stated at original cost less amortization, based on the expected lives of the oil fields served by the carrier. Working capital includes the value of the material and supplies inventory and an element of cash. The cash item is computed by a formula which determines the amount of cash needed to operate the company during the period between performance of the transportation service and the collection of the revenue billed. Intangibles are assigned "going concern" values. The final valuation is considered a matter of judgment and the commission is not required to disclose the exact method used in arriving at it.

A depreciation report is required, the form of which is prescribed by the commission (Circular No. 11). Section 20 of the Interstate Commerce Act grants the Commission the authority to prescribe depreciation rates for common carriers. The Commission's Order No. 19200 dated November 13, 1934 provides for the depreciation procedures applicable to pipe lines. Composite rates, based on estimated average service life, are used for all assets within a primary group. Gains or losses on sale or retirement of carrier property may not be recorded in income or surplus accounts without prior approval of the Commission. Adjustments of annual rates may not be made to correct past errors in service life estimates.

The Pipe Line Consent Decree — and Related Report

The Interstate Commerce Act contains anti-discrimination and anti-rebate provisions, Sections 2, 3 and 67 being the principal ones. Section 2 provides that, if any carrier shall directly or indirectly by any special rebate draw back or charge greater or less for any service rendered than it charges any other person for such service, it shall be guilty of unjust discrimination. Section 3 provides that it shall be unlawful for any common carrier to give any undue or unreasonable advantage to any shipper. Section 67 provides that no carrier shall refund or remit in any manner by any device any portion of the rates charged. These three sections tell the carriers what they cannot do so far as showing favoritism to any shippers, but the Act did not provide any strong penalties for violation.

The Elkins Act, passed in 1903, put teeth in the anti-discrimination and

anti-rebate clauses of the Interstate Commerce Act by making the recipient of rebates liable for treble damages. The Justice Department brought suits in September, 1940 under the Elkins Act against most of the shipper-owners and their subsidiary pipe line companies or departments. The government contended that the dividend or profits being received by the shipper-owners were rebates from the rates filed by the carriers with the I.C.C. The damages asked, three times the alleged rebates, approximated $1,500,000,000.

The cases did not go to trial. On December 23, 1941, the parties entered into an agreement known as the Pipe Line Consent Decree. The purpose of the consent decree is to limit the amount of dividends that a pipe line may pay to its shipper-owners. Briefly stated, the principal provision of the decree provides that "no defendant common carrier shall pay to any shipper-owner in any calendar year, commencing as of January 1, 1942, any dividends derived from transportation or other common carrier services which in the aggregate is in excess of its share of 7 per cent of the valuation of such common carrier's property." The decree defines valuation as "the latest final valuation of each common carrier's property owned and used for common carrier purposes, as made by the Interstate Commerce Commission."

The Pipe Line Consent Decree had, for consent decrees, very unusual compliance provisions. Each defendant is required to submit annually the following information: (1) the common carrier property valuation, (2) earnings derived from transportation, available to pay dividends, (3) dividends paid, and (4) transfers to and from special or "frozen" surplus. Item 4 probably needs further explanation. The provision arises from one of the strange and seemingly illogical agreements contained in the decree. In 1934 the Interstate Commerce Commission started an investigation on pipe line rates and in 1940 reached the decision that crude pipe lines earnings should be limited to 8 per cent and product lines earnings limited to 10 per cent of valuation. The consent decree, however, stated that dividends could not exceed 7 percent of valuation. Thus, if a crude pipe line earns its maximum 8 percent, it has 1 percent that cannot be paid in dividends. The 1 percent becomes a special or "frozen" surplus, and it is frozen until such time as the pipe line is liquidated. The funds representing this special surplus may be invested in carrier property or other income-producing properties. The value of such carrier properties must be deducted from the valuation on which 7 per cent may be paid in dividends.

Recording Revenues

Common carrier pipe line companies are required to file rate schedules (commonly called "tariffs") setting forth the charges on interstate movements and

the various regulations and requirements applicable to the movements. The rates are expressed in cents per barrel. The tariffs must be printed, filed in advariance of the effective date with the commission, and be available for public inspection. There are two types of tariffs—local and joint. Local tariffs pertain to movements by a single carrier, joint tariffs to movements by more than one carrier. The Interstate Commerce Act provides for through routes and tariffs covering shipments over two or more lines. The initial carrier usually files and publishes the joint tariffs.

The act requires a just and reasonable distribution of joint tariffs. The usual method for distributing joint tariffs among the carriers is the "10-90" basis. The participating carriers share equally in 10 per cent of the tariff and divide the 90 per cent primarily on the ratio of each participating carrier's share of the total miles of the movement. The equal distribution of the 10 per cent is based on the premise that each carrier performs the same amount of paper work in handling the movement. The commission has the authority to divide joint rates if the carriers can not reach an agreement. Any interested party may challenge the regulations or rates of a tariff by petitioning for a hearing by the commission. The regulations are an important part of the tariff. They set forth the duties and responsibilities of the carrier, describe the types of oil the carrier will handle, state the minimum amount (or tender) that can be shipped, spell out the carriers' liability for losses in transit, prescribe gauging and testing requirements and specify who shall furnish delivery facilities.

This discussion will be limited to the recording of transportation revenue—Accounts 501 (gathering) and 551 (trunk line). The uniform system of accounts does not prescribe the accounting procedures for recording transportation revenue; nevertheless, certain accounting procedures have become standardized in the industry. The gauging information, the tariff and the tender of shipment provide the basic information for recording this revenue. The gaugers, by preparing and signing the run tickets (gathering lines) and delivery or transit receipt tickets (trunk lines), provide the required information for the custody transfer of the oil. The tariff sets the route and the transportation charge. Oil offered for transportation must be for a movement that is specified by a tariff. The offer is made to the pipe line company by a "tender of shipment," which is a document that contains pertinent information, such as the pipe line order number, barrels tendered, I.C.C. tariff number, the carrier's tariff number, origin and terminus of the shipment, the route, and storage instructions, if necessary. A "notice of tender" is issued by the originating carrier to connecting carriers, if any, participating in the movement.

The pipe line company maintains a record of shippers' oil in its custody by

the tender numbers. The time at which the pipe line allowance is deducted from the tender depends primarily on the method of billing transportation charges. Although transportation revenue is accrued monthly in terms of oil shipped, the billing of trunk line charges and the deduction of pipe line allowance on the tender may be handled by two alternative methods. One method is to bill the transportation charges and deduct the allowance on the basis of oil delivered each month, even though tenders of shipment have not been completed. The other method is to render the invoice and to deduct the pipe line allowance on the basis of completed tenders.

There are several other procedural features. Gathering charges usually are billed monthly on the basis of total barrels gathered. It is customary for the delivering carrier of a joint tariff to bill and collect the total transportation charge from the shipper. The participating carriers bill their transportation charges to the delivering carrier.

An example of the accounting for quantities follows:

Oil Accounting—Barrels

Tender ledger		Oil stocks		Pipe line oil (allowance)	
(1) Receipt	(2) PLA	(1) Receipt	(3) Delivery	(2) PLA	(4) Loss
	(3) Delivery		(4) Loss		

(1) Receipt from shipper—per run or receipt tickets.

(2) Pipe line allowance, if any, to carrier—per tariff.

(3) Delivery to shipper or consignee—per delivery tickets.

(4) Loss of oil by leaks, evaporation, etc.—per loss or stock reports.

NOTE—The tender ledger control is supported by detail accounts in the same manner as an accounts receivable ledger supports the related general ledger account. The balances and totals of the tender ledger and the pipe line oil account equal those of the oil stocks account.

Monthly Inventory

The pipe line company takes an inventory of oil each month. Large companies usually maintain inventory records by operating segments in order to provide stronger control over oil stocks. The engineering department computes the volume (in barrels) of the pipe, manifolds, traps, etc. so that, with a full line, a fairly accurate computation of the oil stocks can be made. There are, however, a number of problems that make it difficult to arrive at an accurate quantity of oil in the system. For example, in order to make an engineering department's computation meaningful, the lines must be full at the time of in-

ventory. This problem plagues gathering lines more than it does trunk lines. Another problem concerns the time of gauging at the various terminals so as to get active tanks as close to the inventory hour as possible. Pipe line companies usually use 7:00 a.m. of the first day of the month as the cut-off time, but some products lines use midnight of the last day of the month. Pipe line companies which cross the time zones have a special problem. Assume that a crude pipe line is moving oil from west to east and the stations in each zone use 7:00 a.m., then the stations on the western side are short one hour's oil, as compared to the eastern stations. To correct for this factor, one company adds the barrels pumped for one hour by the station closest to the zone line to the barrels measured at the western stations.

It is also difficult to determine the temperature of the oil in the lines. The expansion and contraction of the oil due to temperature changes in a long, large-diameter line can result in considerable variations in total oil stocks. Each degree of change in temperature will cause an error of approximately 500 barrels in a line holding a million barrels. Some companies install recording thermometers on the discharge and suction side of pump stations and then compute an average temperature for the oil between stations. This usually provides sufficient accuracy to maintain control over oil stocks. Some companies make no attempt to adjust for temperatures variations and, therefore, usually experience large overages in the summer and correspondingly large shortages in the winter.

Recording Expenses

The basic accounting records of a pipe line company are essentially the same as those maintained by any commercial enterprise. The accounting departments usually are large enough to provide the division of responsibility necessary to achieve adequate internal control over financial accounting and operating activities. Punched card accounting can be adapted easily to pipe line operations. The repetitive tabulations of information available on the cards simplify the compiling of statistical and valuation data required by regulatory agencies. Oil accounting generally had been a manual operation until a few years ago but, as soon as one company proved that it could be performed by tabulating equipment, others rapidly followed suit. Some companies now are using electronic computers for oil accounting and also are experimenting with electronic control and forecasting of oil movements.

The chart of accounts assigns account numbers to the primary expense accounts. Operating expenses (Account No. 411) and pipe line taxes (Account No. 412) are the account classifications which will be given the most attention

here. The other expense accounts are comparable to "other deductions" found in the income statements of commercial enterprises.

Operating expenses are divided into four general accounts—maintenance, transportation, general office salaries and expenses, and other operating expenses. The general accounts are subdivided into numerous objective classifications. The account numbers are assigned in series—gathering lines from 601 through 641, trunk lines from 651 through 691 and general clearing accounts from 751 through 791. Thus, for any objective expense, the trunk line number is 50 more than that of the gathering line account, and the general account number is 100 more than that of the trunk line account. For example, Repairs of buildings would be coded as follows:

Gathering lines	411 — 604
Trunk lines	411 — 654
General clearing accounts	411 — 754

The primary expense classification of pipe line taxes includes the following types of taxes: income and excess profits taxes, capital stock taxes, property taxes and other taxes (payroll, licenses, fees, etc.). The I.C.C. considers income taxes to be an expense in the same classification as general taxes. However, income statements prepared for use by management and stockholders usually follow the accepted form for income statements of industry in general.

Some companies divide their pipe line system into operating units or segments for accounting purposes. This break-down provides smaller units to supervise and, by establishing budgetary controls, management can identify efficient or non-efficient units readily. The operating results of the units can be graded against the optimum set by the budget, the prior operating period or the previous year, and with the results of other units within the system. Responsibility accounting is fairly easy to install when punched card accounting systems are already in use.

The Special Problem of Line Losses

The exact amount of line losses is impossible to determine. As mentioned previously, inventories cannot be determined with complete accuracy. The oil lost because of line leaks or breaks and by evaporation does not pass through meters as it leaves a pipe line system. Repair crews prepare estimates of losses when they repair leaks and, through years of experience, have become proficient at it. Crude oil does not soak into the ground or evaporate as rapidly as products; hence larger recoveries from crude line breaks can be effected. The pumping reports of successive pump stations also give an answer to losses in

transit. If Stations A and B are pumping the same type of oil at the same rate, with Station A pumping 5,000 barrels an hour and Station B only 4,500, there is a strong possibility that losses have occurred between the stations. The monthly inventory of oil in the system is one way of determining over-all losses. If the inventory discloses a large shortage, the company generally will record a loss of oil in the accounting records.

Companies which do not have an operating oil supply can record the losses by purchasing oil from the shippers, charging the purchase to a loss account. This purchase of shippers' oil reduces the quantities that have to be delivered, thus bringing the oil stock in the system and the quantity of shippers' oil into balance again. Other companies, even though they maintain a complete or partial operating oil supply, likewise reflect the losses by purchasing sufficient quantities from their shippers. Some companies reflect losses of oil by reducing the quantities of their pipe line allowance oil and charging the book value of such oil to a loss account.

Let's Keep an Eye on Research

by W. W. HASS*

There have been several fine articles in recent *N.A.A. Bulletins* describing certain techniques for effective budgeting and reporting of expenditures for research and development. However, in view of recent, and future, sharp increases of research costs it seems important that the discussion be expanded into all of the potential areas of responsibility of accounting and financial management. These areas of responsibility are: definition, recognition of objectives, participation, control, and recovery of costs.

The first responsibility must be to define research-type costs for our own companies. Although, presently, these definitions vary widely, there appear to

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be two types of research: basic and applied. Development costs, in turn, may be categorized as pre-design, design, prototype production, tests, etc. The systems of project cost accumulation and budgeting should be conformed to the type or category of research costs in accordance with their character as expressed by the definitions.

The second responsibility is to recognize and support the objectives of research expenditures. These objectives might be to (a) develop new products (which will eventually replace the old ones), (b) to improve present products and (c) to develop new or improved processes to reduce costs. These objectives are aimed at meeting or "beating" competition. In this era of rapid technological progress, research is a form of insurance covering tomorrow's business.

The third responsibility is effective participation by accountants in the evaluation of proposed research appropriations, along with research, engineering and marketing management. This requires all the efforts needed to assure realistic development schedules, an estimated range of money to be spent, the estimated sales and range of profit yield, and the company benefits to be derived other than direct profit yield. Certainly, a good deal of thought should be directed toward development of standard questions that would establish which proposals should receive priority.

The fourth responsibility is control. An effective system of budgeting and reporting actual costs in comparison with budgeted rate of expenditures, by area of responsibility, is a minimum requirement. These reports must go on to reflect technical progress to date in relation to the progress committed in the original proposal. Proper motivation and effective utilization of high-salaried talent cannot be overlooked by control accountants in assuring maximum results at minimum costs.

The final responsibility is to assure full recovery of research and development costs. To do this requires sound techniques to accomplish the following:

1. Protect proprietary interests in new ideas.
2. Minimize disallowances of costs on government-sponsored projects.
3. Match product cost, including research and development, with related product income.
4. Assure recovery of research costs through intelligent pricing.

However, whatever the future research of a company, it can become profitable only through participation of accountants and other financial personnel, and a way of doing it is to improve and publicize our techniques.

What Business Needs Most from E.D.P. Machine Manufacturers

by BENJAMIN CONWAY

IT MIGHT BE WELL to consider briefly the requests businessmen are now making of equipment manufacturers before proceeding to what might be required in the near future. Some of these points may seem trivial or obvious, but they are very real to present and potential users of electronic equipment and, although it may seem that we are severely criticizing business machine manufacturers, this is not true. The manufacturers have done a fine job in their equipment design and improvements, in their research programs, and in their efforts to help prospective users. The points being made now are to help the manufacturer raise his already high standard of performance.

User Needs as Related to Present Equipment

First and perhaps foremost, business users would like to have accurate specifications on the proposed system. Most users in the past were reasonably sympathetic with the manufacturers' design and production difficulties and would accept small variations from the original specifications. However, when this particular piece of equipment or that special feature failed to materialize or when design changes necessitated major increases in cost, industry users began to balk. It seems only fair that, when a user has sunk several hundred thousand dollars in preparing for a computing system, he should receive the system for which he has prepared.

An important point and one which may have stopped many prospective users almost before they started is the high initial cost of an electronic data processing application. The costs of systems analysis, systems design and coding, site preparation, "debugging," and systems testing add up to a very substantial sum. When to this is added the rental costs for the equipment when the system in producing little useful work during the low initial loading and the parallel operation periods, the total cost gets to be very high indeed. Many people feel that the manufacturers should attempt to revise their rental structure so

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that only low rental costs are incurred at these early stages and that the rentals could then rise above current figures as the system becomes more and more productive. Perhaps this could be achieved by reducing initial costs and increasing second and third shift rentals. In any case, no matter how it is arranged, a new approach to rental structure would be welcomed.

To further reduce initial costs, I believe that the manufacturer should attempt to introduce programming aids at a very early point in the installation. Experience in the past has tended to show that service routines, automatic coding routines and so on, have not been available when the effort first got under way. Because of this, most user programming groups have had to work in machine coding and have had to develop their own service and housekeeping routines. We know that the situation has been greatly improved and that most manufacturers have large programming research staffs. However, there is still a feeling that these staffs do not always produce routines which business feels it needs. This lack of communication can be overcome by the better utilization of users groups; the manufacturers should encourage the setting up of a type of liaison with these groups so that their programming efforts will yield practical results.

Another point at which the manufacturer and the user of electronic data processing equipment have not always seen eye-to-eye in the past concerns equipment delivery dates. This has tended to work in one of two ways. The first has been that the equipment delivery has been delayed. When this happens, the user is forced to keep an expensive programming group sitting around idly. Alternatively, the user has often hopelessly underestimated the time required for programming and conversion. In this case the system is installed before it can be used effectively, another costly procedure. Since the user has often relied heavily upon the manufacturer's representative for technical assistance in setting up his timetable, the user, perhaps illogically, blames the manufacturer for this state of affairs. The answer from the manufacturer's viewpoint, of course, is that he should, through his technical representatives, assist the user in drawing up a realistic program timetable and also that he should set reasonable delivery dates for himself.

Still a further requirement that industry would place upon the manufacturer is that of providing adequate breakdown coverage. A computing system which is not functioning is the nightmare with which executives often have to live. Their lot would be considerably improved if they knew that time was always available to them locally on similar equipment. If this ideal cannot be achieved, the manufacturer should at least provide standby equipment of his own at some reasonably located point. It should never be necessary, say, for

a user in San Francisco to have to fly his personnel and tapes to New York in order to keep his paperwork processes functioning.

Among yet other important matters on which the manufacturer should supply information are adequate details for site preparation and air conditioning. I do not know why manufacturers should be so modest in this respect, but I have knowledge of at least two installations for which the space recommended by the manufacturer had to be considerably increased to provide good working conditions. It is much easier to allow extra space at the planning stage than to have to create it when the program is well under way.

In the areas of programming training and aids, the manufacturer has his greatest non-machine responsibilities. The manufacturer's representative is expected to take a group of inexperienced people and train them in an art which is, to say the least, complex. To do this, the representative, himself, must be fully trained, both from the theoretical and practical viewpoints. He must also be aware of the principles of teaching, since knowledge and the communication of that knowledge are two entirely different things. In addition, the representative must be backed by adequate training material such as programming manuals, programming sheets, templates for charting, visual displays and so on. It is to the manufacturer's advantage that this material be well prepared, since nothing can destroy the confidence of a beginner more than to see a programming manual full or errors and corrections.

As a good installation is almost as vital to the manufacturer as to the user, it is also desirable that the training courses be adequately supervised and the participants tested at its close. Also, where required, the manufacturer's representative should be prepared to comment upon the suitability of any individual where, during the training course, it becomes apparent that such an individual may not fit into a programming group. Characteristics such as over-aggressiveness, disinclination to work and inability to work under pressure may show up during a prolonged training period, even when the individual concerned has passed all the theoretical testing procedures. These characteristics, which may cause trouble in a working group, should be commented upon.

Very importantly, routines should be available which will assist the user in program "debugging" and, fairly obviously, adequate machine time should be made available to a prospective user in order that he can "debug" and systems-test his initial programs prior to delivery. If the manufacturer feels that he cannot increase present "debugging" time free of charge, he should endeavor to work out some arrangement by which the extra time would be granted and paid back at a later date by the manufacturer taking time on the user's equipment.

Wherever possible, the manufacturer's technical representative or representatives assisting a user should not be changed at least until the initial programs are operating satisfactorily. Even if the replacement is of equal calibre to the replaced man it can be a time-consuming business to bring him up to the required state of knowledge. If replacement is unavoidable, the user will obviously take a reasonable point of view but, if he believes that the company is being used as a training ground for the manufacturer, unpleasantness will probably arise.

The manufacturer must also ensure that the computer is adequately maintained. This requires not only the services of an expert maintenance man or team but also the establishing of an adequate source of parts and supplies on the user's premises to cover all but major breakdowns. It also requires the setting up of a preventive maintenance program at times suitable to both the user and the manufacturer.

— *And Future Requirements*

The foregoing material has dealt with present requirements and existing equipment. Now let us turn to some of the requirements that industry will be making in the near future. Let us consider first companies now uncommitted, the potential users. For the companies in this category, cost is probably of major importance since most large companies, or companies in which money for new projects is fairly reasonably available, will already, in one way or another, have made their approach to electronic data processing. These presently potential users, then, would be intensely interested in cheaper equipment than is now available. While it is true that modern systems offer far more for the computing dollar than earlier machines, this second-generation equipment has not decreased the basic cost at the lower end of the scale. Rather, the tendency has been more to introduce a new category of equipment with medium and medium-large costs which can perform as much work as the previous large-scale systems. This is evidently a step in the right direction and should be continued throughout the entire gamut of electronic machines. What is needed in addition, however, is that there should be a class of machines which will do the work now done by the present medium and small-scale tape-and-card systems at much lower total costs. With modern computer logical designs and extensive use of transistors, it would seem that this should not be too difficult for manufacturers to achieve. If this is not so, the manufacturers should make announcements to this effect. There is a large group of potential users awaiting such equipment.

Through talking to representatives of many users, we feel that this reduction in cost is a much more desirable trend than aiming at increasing machine capacity and capability. Responsible people in industry feel that it will be many years before they have learned to use the capabilities of present equipment. Hence, they remain comparatively unimpressed by the announcements of machines which will operate in micro-micro-seconds instead of in micro-seconds. These people feel that most of the features that they require in computing systems are presently available, although not always in the same systems. A consolidation of such features as core memory, parallel rather than serial transfer of data within the computer, adequate internal control checks, faster input-output equipment, a greater degree of simultaneity between input, processing and output, and the ability to perform multiple programming seems to be much more important that a fantastic increase in the speed of internal processing.

A major cost associated with electronic data processing when operating in a decentralized company is that of communications. This is an area in which industry would like to see some major improvements. At present wire communication networks are tied up by the relatively slow speed of transmitting information and the very slow speed of receiving the information. These networks would be speeded greatly if a paper tape or punched card transmission could be recorded directly to magnetic tape, and could be speeded even more if data were transmitted on a magnetic tape to magnetic tape basis. These tapes should, of course, be compatible with the computing system. Among other requirements of a communications system, would be the ability to perform some editing of the information while it is being transmitted and better methods of error detection and correction than are currently available.

It was said above that most of the features of electronic data processing equipment which are considered desirable by industry can be found in one or more of the modern computers. There is one area, however, in which many users feel that much can be done. I am referring to the area of random access. If a random access system of several million character capacity could be developed at approximately the same total system cost as with mass magnetic tape storage, then present methods of processing could be completely changed and many applications not presently suitable for electronic data processing would fall easily into place.

The storage of information on numerous reels of magnetic tape necessitates multiple machine runs, a great deal of lost time in having to pass the same tapes through the system many times, and extra time spent in sorting and collating. It creates difficulties in interrogation of information contained in the tape files and may, in cases in which these interrogations need to be answered im-

mediately, require the addition of expensive off-line interrogation units or voluminous print-outs in order that normal processing should not be unduly disturbed. Large random access systems at the level of cost I have indicated would obviate the necessity for all this and would, therefore, greatly simplify electronic data processing and, at the same time, increase the usefulness of the systems. There would be no need to sort incoming items; they could be handled in the order in which they arrive. There would be no need for multiple master files or numerous machine runs and all the processing, including file maintenance, would be performed in a single run. I do not know what the manufacturers have "in the mill" for the development of truly large, truly cheap random access systems, but it does seem to me, and to others, that in the area of machine design this could prove to be the most fruitful from the users' viewpoint.

The area which would seem to be promise most, outside of the actual equipment, has been mentioned briefly earlier. It is automatic coding. At this point, I want to broaden the area to include a universal machine language and the development of systems packages. It just seems unreasonable to us that different groups of people have to go through the same gropings, through the efforts of systems analysis and design, through the drudgery of coding without being able to take full advantage of the experiences of others in similar work. When we consider, for example, the many public utilities which, completely independently and often in a most amateurish manner, have developed systems for customer accounting functions, the waste of time and money involved becomes incredible. Customer accounting may vary from one utility to another but the essential character of the job remains the same. A generalized program developed by a professional group which could then have been adapted to the particular needs of any one utility could have resulted in the savings to each user of many thousands of dollars, and the savings to the industry as a whole could perhaps run into the millions. We are aware that, as a practical matter, utilities which have had to struggle along on their own might not be too interested in joining a combined industry group now, but we feel that they could be so persuaded if it could be effectively demonstrated to them that such participation would benefit them in the development of new applications and, just as importantly, in the revisions of the programming of existing applications. We believe, however, that the impetus for this must come from the machine manufacturers. We are aware that some manufacturers have industry specialists who do help to carry the experiences of one company to another, but we feel that this falls short of the goals which can be attained.

By and large manufacturers have tended to shy away from the broad "language" area as being outside their sphere of responsibility or as being im-

practicable of development by them but we believe that this is untrue. We feel that there is sufficient work of a like nature within each industry or group of industries to make the development of the systems approach a worthwhile and important endeavor. We feel, furthermore, that manufacturers who do develop the systems approach will have a tremendous competitive advantage over others. Costs of this could perhaps be borne by the manufacturer and industry group.

These then we feel are the three basic future requirements for manufacturers:

1. To develop cheaper equipment at all levels of equipment capabilities, especially the medium and small scale systems.
2. To develop random access systems which are gigantic in comparison to modern equipment and at a price not far out of line with tape storage.
3. To develop the systems package encompassing both the systems and the machine rather than the machine alone.

Mutual Interests of Manufacturers and Users

Let us not forget, however, that industry feels that these are additional requirements on the manufacturer and that he should continue to supply and improve upon these services. We know of many instances in which machine selection has been made on the basis of service supplied in the past rather than on the characteristics of the machine in question. As acknowledged at the start, what has been said on these pages is not meant to be a criticism of manufacturers. They have performed well in the past, but much remains to be done in the future and both manufacturer and user will benefit from further, substantial progress.

Depreciation Provisions in Standard Costs

by FRANK J. McLAUGHLIN*

THE TRADITIONAL approach to the construction of manufacturing cost standards, when such standards are used for variance determination together with process and finished goods inventory valuation, should be analyzed in the light of present methods employed for depreciation.

So long as straight-line methods are employed, the provision in standard cost for depreciation presents a picture of uniform annual cost for a given piece of equipment or a whole producing facility. This treatment of provision for depreciation in developing the total cost of production seems logical and as fair a statement of fact as can be presented to management. In instances where sum-of-the-digits or declining balance methods are employed for depreciation determination, a multitude of problems can arise when standard costs are being prepared for adoption. If your standards reflect the anticipated charges to be reported for the ensuing period, you are faced with an inflated cost picture at the beginning of the life of the operation. Conversely, during later years, your standards reflect understated costs. If an attempt is made to employ straight-line depreciation in the standard for comparison to actual costs on sum-of-the-digits or declining balance methods, continued explanation of the resulting variances will be burdensome.

One way of solving this problem has been the use of the straight-line depreciation provision in cost standards together with comparison to actual straight-line depreciation charges, even though the method employed in accounting is sum-of-the-digits. Comparison of standard versus actual cost is accomplished by splitting the actual depreciation charge into two parts: (1) the amount equal to normal straight-line depreciation and (2) the excess charge (or future deficiency) caused by sum-of-the-digits methods.

The portion of the depreciation charge equivalent to the straight-line amount is carried into the actual cost of production. Excess charges are routed to an account entitled "special charges" and appear with overhead cost allocations by product line.

The use of this approach almost permits us "to have our cake and eat it too." The standards are understood by production personnel and variances are explained for manufacturing reasons (as opposed to accounting mechanics.) Inventory valuations are essentially the same from period to period as our standard costs are revised.

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Meeting the Needs of Specialty Foundry Costing

by ELGAR W. THOMAS

CONSIDERABLE VARIATION of size, material content and quantity of our products necessitated the installation of an accurate and efficient system of individual item cost recording and reporting which could be used for production scheduling, pricing of inventory, bids for future sales and control of costs incurred. Although many foundries still utilize a cost system which allocates costs on the basis of tons produced, we felt that such a system applied to centrifugal casting operations in our recently expanded and modernized foundry would not yield accurate results, due to the difference in various types of metals used in the products and the numerous types of products cast for our steel and tubes division.

An analysis of melting, casting and machining operations indicated that a definite cost could be established for each hour of direct labor on a given product. However, management had requested that costs, both for cost of sales and inventory pricing, be at actual so that over and under-absorbed expenses would not have to be allocated or shown separately for statement presentation. For production scheduling purposes, bidding purposes and measurement of efficiency, it was naturally desired that standard-time rates be established for each particular job and operation in order to have an efficient measure of production and costs. To satisfy these divergent interests and needs, actual costs were recorded for book purposes and standards maintained on statistical records.

Development of the Standards

The formation and the installation of the system was achieved by careful study and coordination of all departments concerned (sales, production, engineering and accounting) so that all the appropriate needs of each department were met. The costs per standard hour include direct labor, materials, power and gas; also the cost of indirect power, salaries, labor, maintenance, overtime, foundry expense, general departmental overhead, etc. This correlation was developed and analyzed over a six-month period and proved to be more accurate than a cost per pound correlation.

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Standard Cost Sheet

Type metal: Iron — Type casting: Single metal

Direct Costs:	Cost per standard hour
a. Labor	$ 2.047
b. Stores	.601
c. Power	4.572
Indirect Costs:	
d. Power	.085
e. Salaries	.172
f. Miscellaneous labor	.721
g. Maintenance	1.073
h. Overtime	.072
i. Supplemental payroll	.571
j. Foundry expense	1.982
k. General department overhead	1.341
Total melting cost per direct labor hour	$13.237

EXHIBIT 1

The development of the standards adopted was divided into two phases:

1. Time standards for direct labor which were based on time studies performed by the industrial engineering department. Operational times were established for each function in the production of the various products. Time was then extended by rates to arrive at a cost for each product as follows:

CALCULATION OF DIRECT LABOR COST PER STANDARD HOUR — MELTING DEPARTMENT

Alloy Iron

Job Title	*Melting Hours*	*Hourly Rate*	*Amount*
Melter B	9	$2.00	$18.00
Melter A	8	2.10	16.80
	17		$34.80

Standard labor costs per hour $\frac{\$34.80}{17} = \$2.047$

2. Standard costs per standard hour of direct labor as follows:

CALCULATION OF INDIRECT POWER PER STANDARD HOUR — MELTING DEPARTMENT

	Cost of Indirect Power	*Direct Labor Hours*
July	$ 75	810
August	80	925
September	70	900
October	60	800
November	75	765
December	65	815
	$425	5015

Standard indirect power cost per hour $\frac{\$425}{5015} = \$.085$

Standard cost sheets were prepared for each center by type of product cast (cast iron, steel, stainless steel and dual metal) as shown on Exhibit 1. The standard material, labor and overhead rates enable the preparation of standard variation reports by departments and investigation of variations which are material in amount by job numbers, if so desired. The system has, however, been tailored so that actual costs are distributed to product job costs which are reflected on the job cost cards and general ledger control accounts.

Uses for the Standards

There are three primary uses of standards: (1) production scheduling, (2) cost control and (3) sales estimating.

Production scheduling. The time standards are used to schedule full-production days and to determine the most economical manner of scheduling of melting and casting operations. The scheduler can now refer to standard-time sheets which have been established for each size furnace, by type of metal to be cast, and determine the standard time for total casting weight and number of casts. These standards enable maximum production and cost efficiency through use of the most economical size furnace available, not only for one specific job but also for a combination of melting for jobs which are cast with like metals.

Cost control. Application of standards to measure productivity efficiency is the function of the industrial engineering department. The resulting information is developed and presented in the form of a weekly operating analysis report and a monthly cost analysis.

The operating analysis measures the productivity level of direct and indirect hours and contains the following three basic types of information for management:

1. Comparison of actual and standard production.
2. Lost time caused by mechanical and operational delays.
3. Unbalanced workloads and excess manpower.

The monthly cost analysis compares actual direct and indirect cost of operations to the standard cost, with variances expressed in both dollars and percent.

Sales estimating is performed by the sales department through utilization of the standard amounts. Cost estimates are computed by conversion of the weight of the castings to melting time and the application of the appropriate standard rates to the standard time for melting, casting and machining departments. Through proper coordination of the sales department and industrial engineering department, it is possible to obtain maximum production savings through proper scheduling of common metals for melting in the larger size furnaces.

Application of the Standards

Melting Department. Direct metal cost is allocated to the applicable jobs poured from the furnace based on the percentage of total actual costs for those particular types of metal to total standard material costs for the actual jobs poured. The above allocation of actual metal costs automatically compensates for any melting loss. Credit for overrun metal cast into pigs is given to the department on the basis of scrap value. Total actual labor cost in this department is allocated in the same method as metal costing to total standard labor rates. Actual overhead is allocated to the jobs on direct labor dollars. A melt sheet is prepared, on which is recorded actual materials consumed and a comparison of standard and actual time.

Casting Department. Labor costs are allocated to the jobs on the percentage of total actual cost to total standard labor cost. Actual overhead is allocated to the jobs on direct labor dollars. Actual mold cost is charged to the job on

the basis of estimated mold life. Bad casts are credited to the job at scrap value. The cast report, prepared in this department, indicates the total rough weight of each casting, quantity, standard and actual hours and the mold number.

Machine Department. No standard rates are used for allocation of direct labor costs but labor rates and standard operation time are furnished to the sales department for bid purposes. As in the other two departments, overhead is allocated on direct labor dollars. The industrial engineering department does, however, evaluate production efficiency by a comparison of actual production hours and dollars to standard time and rates. Crop ends, borings and turnings are credited to the jobs at their appropriate scrap value. Machine breakdown time is charged to overhead; functional shutdowns and machine setup time are charged to the jobs. The machining report is prepared, on which is recorded crop-end weight, bad casting weight, final machined weight and actual time by the applicable machining operations.

Systematic Review of the Standards; Actual Costs for Statement Purposes

The maintenance of standards through a systematic review of standards is essential since the standards are used as a basis for costing as well as a tool for operating control; therefore, the frequency of review is of prime importance. The responsibility for maintaining standards is vested in the industrial engineering department. In addition to reviews of standards initiated by a study of large variances, quarterly reviews are required for all standards and immediate recomputations made when operating procedures or material and labor costs change.

A job cost card (Exhibit 2), prepared in the general accounting office by the tabulating department, indicates total actual melting department cost, casting department cost, machining department cost, mold cost, gross metal cost less applicable credit for bad castings, crop ends and borings and turnings, actual direct outside cost, if any, and gross billing to date.

Acceptance of the System

Beneficial experience for the past few years has justified the installation of this system, which is based on time cost allocations rather than the tonnage cost allocations common in many foundry operations. Through the development and application of time standards, it is feasible to effect a better utilization of production facilities through proper production scheduling. The sales

Cumulative Cost and Billings

Period Ending

Sales order	Operation	Hours or pounds	Detail cost and billings	Total cost and billings	Net total
5555	Melting	5,012	210.98		
5555	Casting	5,012	345.67		
5555	Mold cost		55.00		
5555	Metal cost	5,012	123.45		
5555	Borings, turnings	50 CR	1.23 CR		
5555	Crop ends	25 CR	.75 CR		
5555	Heat treat		123.00		
5555	Machining	50	54.32		
5555	Welding	25	45.79		
5555	Grinding	75	65.65		
5555	Repairing	10	3.76		
				1,025.64	
5555	Billing	4,937 CR		1,132.10 CR	106.46 CR

Note: For illustrative purposes the operation or element of cost is written out rather than use of the usual code number references.

EXHIBIT 2

department, working closely with the production scheduling department, is put in a better position to bid on similar jobs. These can be produced simultaneously or delivery of an order may be deferred so that production can be scheduled with later production of similar items. In addition to the above, the system also has presented the main features of other standard cost systems, mainly a realistic standard allocation of indirect costs to jobs and effective control of production costs through prompt analysis of variances.

Progressive Organizations Provide for Accounting Training

by C. E. KURLANDER and G. L. BATTISTA

THIS PAPER deals with the training and attention that should be given to employees to develop personnel for the ideal accounting organization. It is based on a survey made of a number of companies in the same geographical area through a questionnaire concerning their accounting training programs. The results of this survey are interspersed throughout this paper, wherever they are applicable.

Training Programs — Number and Objectives

It was surprising to learn that relatively few companies have formal accounting training programs, as indicated below:

NUMBER OF COMPANIES HAVING ACCOUNTING TRAINING PROGRAMS

Type of Program	Number of Companies	Type of Program	Number of Companies
Formal	4	In process	2
Informal	9	None	22

Every accounting employee, regardless of his background, should go through a training period during which he is taught general corporate policy as well as accounting policy. Through training he is made conscious of organizational objectives and is encouraged to think in terms of accomplishing these goals. He is indoctrinated with the prospects for advancement, and he is encouraged to pursue a course which will lead to promotion.

In many accounting departments today, the aim is to build an organization with young blood, in the hope of having a strong organization in the future. Moreover, these young people may be groomed for assignments to positions of a management level in areas other than accounting and finance. Provided they

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remain in their chosen field of accounting, it is logical to assume that they will become the nucleus around which the future accounting organization will be built. It is the responsibility of those at higher levels within the department to train and guide individuals who demonstrate by performance the characteristics of managerial potential. Such persons should be encouraged to pursue additional academic studies so that their training will not be limited to the confines of the operations of one company.

Rotation of Employees

The survey conducted disclosed that twelve companies having formal or informal training programs rotate their trainees within the department. The starting point and the type of work initially assigned depend to a large extent on the formal education, previous experience and aptitude of the trainee. To determine aptitude and general intelligence, many companies administer tests. Eight of the companies surveyed indicated that they conduct testing programs. Six of these compaines administer "in house" tests, while two companies make use of a testing service.

In many instances, formal education and experience of the employee may be somewhat limited, and it becomes necessary to start at the grass roots level. In such cases, it is normal to assign the apprentice to a group that will afford the opportunity to handle underlying basic documents and learn the minor clerical details of the department. Additional nonsophisticated work assignments are made during the initial period and for as long a period as is required, commensurate with the employee's demonstrated ability. The length of time a trainee is required to remain in each department by the companies survey is shown in the following table:

LENGTH OF TRAINING REQUIRED IN EACH SECTION OF THE ACCOUNTING DEPARTMENT

	Number of Companies requiring Months				
	3	6	9	12	Longer
General accounting	1	2	–	4	–
Tax accounting	–	2	–	–	–
Cost accounting	–	3	1	1	1
Methods and procedures	–	2	1	–	1
Payroll	2	2	–	–	–

The prospective accountants are closely observed during this period of basic

training and their work output is measured. If promise is shown, they are transferred to other sections through a program of rotation within the department to increase their knowledge, experience, and promotability potential. Young intelligent men are thus strengthened with experience and awareness of professional responsibility is instilled in them.

The rotation plan has the advantage of improving the experience and performance of all members of an organization. It affords the trainee the opportunity of learning all facets of the accounting organization, and it provides for the exchange of ideas. Also, injections of new blood in an organization provides for rejuvenation, and it can prove a stop-gap to "staleness."

In addition to the systematic rotation program, the employee is further advised and encouraged through the media of periodic consultations with the department head, immediate supervisor, or both. The survey indicates that nine companies assign the trainee for advisory interviews to a specific individual within the accounting department, and only five of the fifteen companies do not provide for periodic consultations. At the initial consultation, the program of rotation is explained in great detail.

Encouraging Formal Education

At the same time, the opportunity of furthering formal education through a corporate-subsidized tuition program is offered. The program may afford an individual opportunities which might not otherwise be possible. Guidance in the selection of courses is offered, usually under a cooperative program established by the personnel function of the company and the vocational guidance officers of local educational institutions.

The table below shows what some companies are doing in connection with formal educational programs:

FORMAL EDUCATION PROGRAMS OF FIFTEEN COMPANIES

1. Number of companies providing for formal education on a:	
a. Graduate level	8
b. Undergraduate level	7
2. Number of companies that pay tuition costs:	
a. In full	5
b. Partly	5
c. With limitations	2
d. None	3
3. Number of companies that give guidance in the selection of courses	9

When a trainee has received an accounting degree, he is often offered the opportunity of pursuing studies in related fields, such as management, law, economics, or related subjects. Again, guidance in the choice of graduate study programs is offered with due consideration for the areas in which talent is indicated and the fields in which there are the greatest possibilites of promotion. Such consultations and programs of paid tuition encourage and stimulate employees by showing that the company has a real interest in their development, and it reduces the possibility of employees becoming discouraged and stale.

The Training Program and the Company as a Whole

In the majority of cases, a trainee will take every advantage of favorable circumstances. Normally, he will show his appreciation through hard work and perserverance, and the company will benefit too. Moreover, the company will obtain in this way a trained individual ready to fill any vacancy which might develop.

Periodic promotions are the reward for successful endeavor, and the recognition due to qualified employees is not long in arriving. Most likely, successfully trained individuals will become managers of the departments for which they are best suited. This, by no means, should be the end of the line, and the employee should be impressed with this fact. There is nothing more discouraging to an ambitious employee than the prospect of doing the same job until his superior dies or decides to leave. This condition can well lead to mass exodus of people who have been trained at great expense to the company. Every attempt should be made to retain these key employees. An expanding business can do this by communicating its plans to the employees so that they are aware of the prospects for new positions. The company which has only modest or future plans for expansion has two alternatives: (1) a system of rotation at the management level within the accounting department or (2) the transfer of the employee to other departments where his training and aptitudes may be used advantageously.

In departments where procedures are in a constant state of change or where challenging problems arise frequently, the manager may not become restless but he may, nevertheless, reflect lack of outside influence for growth. For this reason, rotation at the managerial level should be considered. However, there must be adequate personnel to carry on in each position involved. Moreover, transfer to a department involving less responsibility might be construed by a manager as a demotion and this would be demoralizing unless he is advised that the transfer merely constitutes an opportunity for him to become acquainted

with other aspects of the company. Also, from the company viewpoint, it would be costly to continue paying a salary which is high in relation to the duties and responsibilities of the new job unless the company takes the broad viewpoint that it is building managers for tomorrow.

The rotation system within an accounting department cannot go on forever for a particular employee. It reaches the point at which some employees have experienced all jobs at a particular level. An individual either reaches a plateau above which he cannot rise or continues on to broader fields within the company. Once all the prospects and advantages of the accounting department, short of the controller's job, have been exhausted, the capable employee may present problems. Fortunately, there is still an alternate course of action. The training and experiences gained in the controller's department are recognized as valuable by departments other than accounting and such groups often look forward to accepting transferees. It has been found that accounting-trained personnel often strengthen the operations of other departments and relieve personnel with no accounting training from accounting-oriented tasks. Such a transfer may be desirable for the additional reason that it permits greater emphasis on the special talents of the individuals so relieved. Then, too, the individual transferred has the opportunity to broaden his knowledge of the entire operation of the company. The transfer is usually advantageous to the financial organization, because it benefits when the accounting point of view is applied in the operations of the department to which the trained accountant has been transferred.

A survey of the training programs in existence revealed that transfer of accounting personnel to other departments is a very popular feature. It was found that promotions of men trained in a financial organization were made to personnel, marketing, engineering, purchasing, and maufacturing assignments. Exhibit 1 displays the ultimate goals which can be achieved by trainees who graduate from the accounting-oriented training program. Through such programs, companies are attempting to develop personnel for top management positions by allowing them to acquire experience in all the phases of the company's operations.

Of course, such a program requires that a company be constantly searching for areas where an individual possessing the particular qualifications and a record of promotability potential can be best utilized. This program is desirable, not only because it gives the restless manager or other key employees an opportunity to broaden his over-all corporate viewpoint and to add to his worth to the corporation but also because it places the corporation in the position of constantly reviewing its organization structure. Such a program is

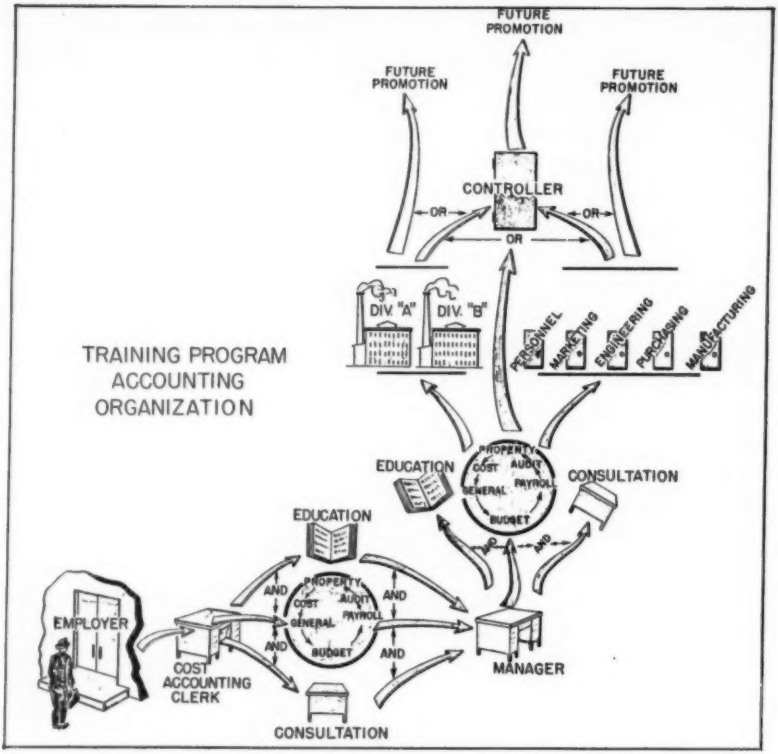

EXHIBIT 1

constantly providing personnel for top management positions in the dynamic company which finds itself constantly expanding. This situation occurs frequently in progressive corporations and especially in those engaged in work involving many of the new technologies resulting from modern day scientific efforts. New corporations are being formed and older corporations are expanding into new divisions to meet the requirements of these new frontiers.

Need for Training Programs

It is quite apparent that the training of employees in a financial organization is mandatory. The program should be organized so as to make available to each employee every possible means of learning new skills, expanding old

skills, and applying his knowledge logically to the operation of his particular company's business. This education must be comprehensive and should include a program of rotation within the sections or groups of the financial department. It should provide for formal education along professional lines at a college, university, or other educational institutions. It should permit transfers, if necessary, to other departments or other divisions. Employees cannot be allowed to become stagnant if they are to progress in private enterprise. If stagnation is permitted, the problem of labor turnover will be great, and the prestige of the department in the eyes of top management will suffer.

It is prudent to prepare for growth eventualities within an organization by an intensive training program. By so doing, the foundation is provided for a dynamic, effective, and enthusiastic organization—one in which its members are granted the opportunities of achieving their aims and of attaining success in the corporation in which they have selected to pursue their careers.

Opportunities cannot be denied aggressive and enterprising individuals, for, if they are, positions will be available elsewhere, and the management development requirements within the corporate entity will not be accomplished. Rehabilitating a stale organization is more costly than a plan which will prevent staleness.

Results of the survey are disclosed below. Let us hope that these data may prove helpful to those companies contemplating the adoption of an accounting training program. The results follow:

RESULTS OF SURVEY — ACCOUNTING TRAINING PROGRAMS

(Responses of 15 Companies Having Such Programs)

1.	Is the accounting trainee given broad experience through a system of rotation within the accounting department?	Affirmative Negative	12 3
2.	Is the accounting trainee given experience in departments other than accounting or finance through a rotation plan?	Affirmative Negative	3 12
3.	During his basic training the trainee is required to remain in each of the following departments for an average length of time as indicated:		
	General Accounting	3-6 Mos. 12 Mos.	3 4
	Tax Accounting	6 Mos.	2
	Cost Accounting	6-12 Mos. Longer	5 1

	Methods and Procedures	6 Mos.	2
		9 Mos.	1
		Longer	1
	Payroll	3 Mos.	2
		6 Mos.	2
4.	Is the trainee assigned to a specific individual in the accounting department for guidance during his training?	Affirmative	9
		Negative	6
5.	Is provision made for periodic consultations between the individual assigned and the trainee in order that the trainee might be advised and apprised of his status?	Affirmative	10
		Negative·	5
6.	The decision to transfer the trainee to other accounting departments is the responsibility of:		
	a. The department head	Department Head	9
	b. The trainee's supervisor	Supervisor	5
	c. The personnel department	Personnel	0
	d. The comptroller	Comptroller	1
7.	Is provision made for formal education to improve the trainee:	Affirmative	8
		Negative	7
	a. On an undergraduate level	Undergraduate level	7
	b. On a graduate level	Graduate level	8
8.	If so, does the company pay the:	Total cost	5
	a. Total tuition cost	Partial cost	5
		None	3
	b. Partial tuition cost.	With limitations	2
9.	Is the trainee given guidance in the selection of courses to be taken?	Affirmative	9
		Negative	4
10.	If so, who gives such advice?		
	a. The department head	Department Head	5
	b. The trainee's supervisor	Supervisor	3
	c. Outside consultants	Outside Consultants	1
11.	Is the trainee given tests to determine his aptitude in various fields of endeavor?	Affirmative	8
		Negative	7
12.	If so, is the test administered?		
	a. Internally	Internally	6
	b. Outside	Outside	2
13.	Are classes held within the company to acquaint trainees with general corporate policies, organization, and procedures?	Affirmative	7
		Negative	5
14.	Are classes held within the department to acquaint trainees with departmental policies, organization, and precedures?	Affirmative	5
		Negative	10

15.	Does your company keep progress reports on each employee?	Affirmative	12
		Negative	2
		In process	1
16.	If so, do these reports serve as the basis for selection of individuals to fill vacancies at a higher level?	Affirmative	11
		Negative	2
17.	Are promotions made from the accounting department to other departments such as personnel, engineering, marketing, or credit?	Affirmative	7
		Negative	6
		Qualified	2
18.	Are promotions made from the accounting department of one division to other divisions of the company?	Affirmative	11
		Negative	3
		Qualified	1
19.	Do departments other than accounting request accounting trainees to fill vacancies in their departments?	Affirmative	9
		Negative	6
20.	Are trainees encouraged to make suggestions with regard to improvement of company procedures?	Affirmative	12
		Negative	3
21.	Are trainees made to feel that they are part of the organization?	Affirmative	12
		Negative	3
22.	Is the training program outlined to the trainee at the time of employment?	Affirmative	10
		Negative	4
		Qualified	1
23.	Is there a salary schedule which provides for automatic increments with the lapse of time?	Affirmative	5
		Negative	8
		Qualified	2
24.	Is there a salary schedule which provides for increments commensurate with the trainee's progress in addition to the lapse of time?	Affirmative	6
		Negative	5
		Qualified	4

Preventing Employee Resistance to a Systems Change

by RICHARD T. CASS*

ANY MODERN BUSINESSMAN will affirm his belief that his most important work is dealing with people. Sometimes, however, only lip-service is paid to this belief. A manager or planner may see only work stations and flowcharts, not realizing that these are only convenient symbols standing for thinking and feeling human beings, who will act not mechanically but according to their human psychology. He may design a mechanically flawless system on paper only to find that it can not be made to function without a great deal of tedious work, continuous checking, harsh discipline, friction, ill-feeling, personnel shifts and firings, and wide-spread disgruntlement.

The time to recognize this fact is in the planning phase of a systems revision, not at its operating stage. Resistance is difficult to overcome, much easier to prevent. Three hints for prevention of employee resistance to a systems change can be expressed in three words: participation, explanation, communication.

Participation. People object to the imposition of a change; if they themselves have helped bring about the change they are naturally more favorably disposed toward it. If an individual has had the opportunity to discuss or approve even a small part of the entire plan, he is inclined to see the good in the rest and not to be sharply critical or obstructive.

However, in his discussion with the persons actually operating the present system, the planner must avoid the slightest hint of patronizing. Nor must he allow himself to believe that the discussions are a mere routine polite formality. These attitudes will be sensed immediately; they cannot be concealed. On the contrary, the planner ought to recognize that no one knows the mechanics of a job quite so well as the persons doing it and that their suggestions are often valuable. The time spent in discussion need not be exorbitant if the planner has a clear view of his objectives and is reasonably familiar with the existing routine.

Explanation. A new system is seldom so perfect that it explains itself. Rather it must be taught if it is to be understood and used. People are interested in both the *why* and the *how* of a new procedure.

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Everyone naturally wishes to know the purpose of his work. An explanation of why the work is to be done in a new way can be clear, satisfying, and brief—if it is well thought out in advance.

Explanation of how to do the job is obviously necessary. The planner must constantly remember that his audience is not so familiar with the revised procedure as he is. Workers will be expected to understand, remember and apply in a relatively short time a whole set of new rules which the planner has had time to assimilate gradually as he developed them.

Obviously the planning will have had to take into consideration in some way every foreseeable variation and detail. The details, as many as possible, should be carefully explained. However, the explanation, to be adequate, must not be merely detailed. The presentation should be first of principles, in order to provide a framework for the detail. A planner's understandable impatience to see his system in operation may jeopardize the success of his plan if he offers only a haphazard, unorganized explanation. A written procedure requires both planner and operators to be careful and complete. It furnishes a single source for reference and provides permanence and continuity.

Of course, not all contingencies can be foreseen and not all can be explained to everyone's satisfaction. Therefore, supervision, if not close and constant, must at least be readily available. Workers will be indecisive and questioning under a new system. If they cannot easily obtain authoritative interpretation, they will begin to act on guesses. Carelessness follows.

Communication. A system is seldom perfectly departmentalized. The work of one individual or department nearly always has a direct bearing on the work of others. If this fact can be made concrete to each worker, numberless misunderstandings can be avoided.

People usually adopt a reasonably obliging attitude toward a reasonably stated request. They generally prefer to be helpful in their work rather than harmful, if only they know of another's requirement. It is surely the job of planning and supervision to make such requirements known among the persons concerned, and it is equally the task of supervision to encourage the interchange of requirements and commonly useful information among workers.

Attention to these hints cannot, of course, bring about the success of a poorly conceived plan. But if employees are invited to participate in the formation of a program, are given the courtesy of an adequate explanation, and are encouraged to communicate among themselves and to management their purposes and problems, a significant step will have been taken toward greater employee satisfaction and easier, more intelligent and more effective operation.

Burden Rate Applications in Project Evaluations

by GLENN F. McWILLIAMS*

IN THE FIELD of economic evaluation, including replacements, expansions, additions, make-or-buy, and other investment decisions, we are constantly faced with the question of whether or not burden rates should be used in cost determinations. In the many articles which have been written in recent years on the subject of profitability of investment evaluations, there has seemed to be remarkably few discussions and recommendations regarding the specific subject of burden rate or cost allocation. Although opinions are quite frequently expressed for or against the use of burden rate applications, there is little expression of opinion on how burden rates should be calculated and applied. This letter is intended to provide a discussion of whether or not to use burden rates in economic evaluation and, if so, what sort of rate to use.

In evaluating major (dollar) investments, a burden rate many times is not a problem because estimates of the individual expenses are made in arriving at the dollar operating advantages and subsequent rates of return on investment. This discussion, therefore, is limited to the relatively small investment such as machine replacements or additions. Even here, the theoretically correct solution (discounting cash flows) requires no burden rate. But, as a practical matter, the cost of making individual projections of expected costs over the lives of many proposed acquisitions would be prohibitive. It is, therefore, suggested that some method of cost allocation be used.

Given a specific problem, there could be as many different ideas on how to calculate the burden rate as there were individuals expressing opinions. Some authors suggest a rate which includes all costs; others one which includes only a few of the so-called "fringe benefit" costs, with most rates falling somewhere in between. Still others (MAPI's *Business Investment Policy*) merely state that burden rate calculation is a decision for top management.

In the beginning we must answer two questions: (1) should the burden rate reflect what is expected to happen to costs as a result of this particular investment or (2) should the rate include other costs which could change over the years as a result of many investments? Which will give the most correct results. A variable bur-

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den rate with the individual estimates of expenses which are expected to change as a result of this investment seems to be the most appropriate. Let us look further into the burden rate calculations.

Overhead costs are usually allocated as a rate for each labor hour, machine hour, piece part, or the like, the most common being the cost per direct labor hour. Many companies have a cost system which they may consider made-to-order for solving investment decisions, one which distinguishes period and variable costs. In machine replacements the major operating advantage is generally a reduction of the hours required. It would seem that use of separated fixed and variable costs could provide the desired overhead costs. However, the application of the variable rate could give erroneous or misleading results. Some variable expenses fluctuate more with the pieces produced than with the hours required to produce them, i.e., inspection, storage, handling, etc. In machine replacement studies, the same production quantities are generally assumed for both the proposed and present machine. Therefore, the use of established variable cost rates may not be the answer.

As mentioned previously, the inclusion of vague possibilities of cost changes in the future have no place in a machine replacement type analysis. We have heard reasons given that, "if we continue to replace machines we may eventually eliminate one shift of operations, thereby eliminating not only the operating and management costs, but also traffic control personnel and others." Giving weight to remote and nebulous factors of this character does not appear realistic.

The practice of including only costs having foreseeable effects is also generally accepted in decisions to invest in new buildings. For example, in the planning stage it is generally impossible to anticipate specific production jobs which would utilize a building to its capacity. However, no credit should be given now for floor space which may be used by future projects or investments. It seems, then, that in this type of investment decision, we should use a direct or fringe benefit type burden rate with estimates of the costs affected as a result of the particular investment decision.

Beyond These Covers

Books

Accounting in Action

B. E. Goetz and F. R. Klein, Houghton Mifflin Co., 2 Park Street, Boston, Mass., 1960, 713 pp., $7.50

Subtitled "its meaning for management," this text for first-year students in accounting makes it clear that both management and accounting are widely applicable and that the concept of enterprise to which they relate is within most individuals' experience. Of the four parts of the book, the first relates accounting to personal, business and governmental needs; the second depicts accounting systems and statements; the third portrays accounting as used by financial and cost management of a business; and the fourth part concerns the connection between accounting and law, economics, social policy and, in particular, the American "way of life."

Financial Management

Robert W. Johnson, Allyn and Bacon, Inc., 150 Tremont St., Boston 11, Mass., 1959, 596 pp., $6.95.

Although not a cost text but rather one on financial planning and execution, this book is, nevertheless, well and closely related to internal accounting and deals with profit planning and capital budgeting, as well as with funds acquisition and maintenance. Short and long-term financing are treated as is the supplementary topic of valuation of business enterprises.

Financial and Administrative Accounting

C. Aubrey Smith & Jim G. Ashburne, McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y., Second Edition, 1960, 640 pp., $8.50.

A comprehensive text intended primarily for the nonaccounting "individual who will be confronted with economic problems requiring a fairly comprehensive understanding (of accounting)," this book explains the accounting process, financial and cost analysis, and objectives and methods of control, both of operating and administrative activities. It includes a chapter on "managerial planning to minimize tax expense."

Accounting for Management Control

William H. Childs, Simmons-Boardman Publishing Corporation, 30 Church St., New York, N. Y., 1960, 714 pp., $7.75.

"A college textbook on fundamentals for those who seek an elementary but penetrating view of the accounting process as it applies to the measurement of business affairs" (to use a quotation from the author's preface), this book stresses both mechanics and significance of accounting. Part V is devoted to business planning and contains several chapters on "special studies," including chapters on the use in such studies of direct costing, break-even analysis, standard cost, and statistical measures.

The Appraisal of Capital Expenditures

C. G. Edge, Society of Industrial and Cost Accountants of Canada, 31 Walnut Street, S., Hamilton, Ontario, Canada, Spiral Bound, 1959, 76 pp.

The subject matter of this initial topical study of a planned series is developed in four parts — the accountant's relationship to capital expenditure appraisal, the methods (especially discount methods), the appropriation request and its significance, and examples of application of methods of appraisal — and is followed by interest tables which certain of the methods call for.

Accounting and Tax Aspects of Patents and Research

J. A. McFadden and C. D. Tuska, D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, New Jersey, 1960, 311 pp., $7.50.

Accounting for research and development costs is given first place in this book but leads rather promptly into the companion (or resulting) topic of accounting for patents and, in Part II of the volume, to consideration of "Taxes on Patent Income or Sales." Appendices include portions of the Internal Revenue Code, tax law sections on patents, a table of cases and a bibliography.

Expense Accounts in 1960

Commerce Clearing House, 4025 West Peterson Avenue, Chicago 46, Illinois, Pamphlet, 1960, 32 pp., 50¢ (Minimum order $1).

Both employee and employer reporting requirements to substantiate deduction of business expense account items — travel, entertainment, etc. — are detailed here in the light of current regulations.

Consumer and Commercial Credit Management

Robert H. Cole and Robert S. Hancock, Richard D. Irwin, Inc., Homewood, Ill., 1960, 649 pp., $9.

A business function which has many contacts with accounting is comprehensively set forth in this book. In considering, in turn, consumer and commercial credit extension, the "basis of the credit decision" occupies a group of chapters in each case. "Measuring efficiency and control of commercial credit decisions" is a final chapter in which "cost analysis" is a final topic.

Aspects of East-West Trade

International Management Division, American Management Association, 1515 Broadway, New York 36, N. Y., Paper Bound, 1960, 95 pp., $2.25.

Exploratory in nature, this group of papers gathers together reflections of government policy and industrial experience in the clouded area of trade between America and Russia, closing with a paper on "Procedures and Methods of U.S.-Soviet Trade." This lists Soviet Foreign-Trade Organizations and the commodities and services handled by each. By no means on accounting, the material treats pertinent matters in the most difficult portion of the international trade area now being given prominent attention by many managements.

Small Industry — An International Annotated Bibliography

Marian Crites Alexander-Frutschi, Free Press, Glencoe, Illinois, 1960, 218 pp., $10.

The materials listed and classified in this bibliography relate to manufacturing enterprises and extend to some materials originating in Africa, Asia (including Communist China), and South America, a portion of which appears to be available only in foreign languages. The project has been carried out under the auspices of the International Industrial Development Center of Stanford Research Institute.

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